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ABSTRACT

This final report describes activities and accomplishments of a 3-year project at Central Missouri State University to develop and pilot test a Continuous Process Improvement (CPI) model as a replacement for the course-credit completion paradigm in 15 academic departments. The pilot CPI project was phase 4 of a 5-phase Decade of Transformation program. Previous phases involved exploration, experimentation, faculty education, and policy development and planning. The fifth phase will focus on generalization and implementation of CPI throughout the university system and dissemination to other institutions. The model's instructional principles are student-learning centered, outcomes-driven, performance-based, and include continuous assessment and feedback. Evaluation indicated that approximately 70 percent of the faculty received training in CPI, with 10 to 15 percent receiving extensive training in assessment-as-learning and/or total quality management. Approximately 40 percent of the faculty have added performance-based assessments to their classes. Over 5,400 students have been exposed to CPI through special workshops, speeches, articles, and in-class discussions. All incoming freshmen and new faculty receive a formal introduction to CPI during orientation. Individual sections of the report include an overview, description of the project's purpose, background and origins, activities, and evaluation/results. Attached exhibits include flow charts, CPI principles, brochures, evaluation details, curriculum materials, and a list of dissemination materials. (DB)

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A Continuous Process Improvement (CPI) Model for Postsecondary Curricular and Pedagogical Reform Based on Assessment-As-Learning

Grantee Organization

Central Missouri State University
Warrensburg, MO 64093

Grant Number:

P116B10480

Project Dates:

Starting Date:	September 15, 1991
Ending Date:	September 14, 1994
Number of Months:	36

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Grant Award:

Year 1	$ 70,398
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Year 3	88,950
Total	$253,275

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Central Missouri State University (Central) proposed to FIPSE to develop and pilot a transformational Continuous Process Improvement (CPI) Model, as a replacement for the course-credit-completion paradigm, in ten academic departments – expanded to 15 departments in 1992. Based on the principles of Alverno's assessment-as-learning and industries' quality management, the CPI model is student learning centered, outcomes-driven, performance-based and is integrated by continuous assessment and feedback. The FIPSE project, Phase IV (1991-94) of a Decade of Transformation, built upon several years of exploration, discovery, experimentation (research), faculty education (cultural change), policy development and planning. The project was driven by, and evaluated against, ten explicit goals which are reported alongside of results in the report. The pilot demonstrated that faculty can fundamentally change from the course credit paradigm to a student learning centered, outcomes-driven, performance-based, continuous assessment model. Central's administration and faculty leaders are proceeding to implement Phase V – generalization and implementation of CPI throughout the university. Central has applied to FIPSE for a dissemination grant to work with eight adapting institutions to develop additional exemplars for systemic reform of universities. A comprehensive program of comparative testing of the CPI model at these eight institutions against the course-credit model at eight comparable institutions will follow this phase.

Title: A Continuous Process Improvement (CPI) Model for Postsecondary Curricular and Pedagogical Reform Based on Assessment-As-Learning

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Titles Project Products (Partial):

1. Report on Phases I and II of the Assessment as Learning Project, 1990
2. TQM: Revolution or Just Another Fad?" Commissioned Paper, AAHE, 1993
3. Decade of Transformation at Central Missouri State University, 1995
4. CQI: A Model for Reform Based on Assessment as Learning and TQM, 1993
5. Central Missouri State University: TQM Pilot Experience, 1995
6. Reflections on AACSB Accreditation: Implementing an Outcomes-based Education Model.
7. Entry Assessment: An Instrument for Measuring Improvement in Management Education.
8. Continuous Process Assessment Plan in Nursing: Outcomes, Curriculum Matrix, Assessments
9. Inroduction to Professional Nursing and Student Portfolio
10. Minimum Competency Exam in Economics
11. Assessment as Unifier of Teaching & Research in Communication, (1995 Winsor & Curtis)
12. CPI Project for Speech Pathology & Audiology: Notebook (Schmidt, 1995)

Title: A Continuous Process Improvement (CPI) Model for Postsecondary Curricular and Pedagogical Reform Based on Assessment-As-Learning

Executive Summary (3)

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A. Project Overview:

Central Missouri State University (Central) proposed to FIPSE to develop a transformational Continuous Process Improvement (CPI) Model and to implement this CPI model in ten academic departments in three years, 1991-94. The project was expanded to 15 departments in 1992 (Exhibit 1). The CPI model is student learning centered, outcomes-driven, performance-based and is integrated by continuous assessment and feedback (Exhibit 2). The FIPSE project, Phase IV (1991-94) of a Decade of Transformation (Exhibit 3), built upon several years of exploration, discovery, experimentation (research), faculty education (cultural change), policy development and planning. The project was driven by, and evaluated against, ten explicit goals for each participating academic department which are reported alongside of results in Exhibit 4. These results are elaborated in section V, evaluation, of this final report.

The answer to the question: "Who was served by this project?" is still developing. Initially, the faculty of the ten self selected academic departments (13 major programs). Then, students majoring in these programs. Next, the faculty in other departments especially those involved in development of Central's new university studies program. Employers and alumni, who volunteered to review and validate student learning outcomes developed by departmental faculty for a major program, were next. Finally, professional staff and non academic administrators were influenced as the mission was sharply focused on the University's core learning process. The espoused mission became a highly consensual mission-in-use. In other words the organizational culture changed to a focus on student learning, explicitly driven by performance-based learning outcomes, integrated by systematic and continuous assessment and feedback.

B. Purpose:

What was the **problem**? "Reform in higher educatio has just been pruning the branches of a dead tree (O'Bannion, 1995)." "It's the system stupid (Mullin, 1994)!" A thorough review of the failures (anamolies) of higher education that led to the development of the CPI model is presented in pages 1-5 of our 1991 proposal to FIPSE. This review provides clear evidence of paradigm failure but no examples of paradigm change in higher education. One lesson learned is that the first step in creating a quality system is to consciously and explicitly examine the logic of the assumptions underlying the existing system. This conviction, that real reform requires breakthrough thinking, has been strengthened by our experience.

The **purpose** of this FIPSE project was to **develop** and **pilot test** a model for postsecondary curricular and pedagogical reform; and, to disseminate the model and results to aapropriate forums as a guide to reform in higher education. The **model** was conceived as an alternative paradigm to replace the 100 year old course-credit-completion paradigm. The **pilot** was to test the feasibility of implementation to determine if university faculty would accept such radical and labor-intensive change and provide leadership for the next phase of system-wide reform of a complete university. Transforming one institution requires transcendent leadership, tireless effort and patience. If that was our only purpose, however, the project would not have been justified. Our long term purpose was and is to be a major influence in changing the prevailing paradigm and thus university systems throughout the United States. We believe only systemic change is durable. Setting up the next phase (Phase V), which

includes leadership to develop a set of exemplar institutions, was also an important element of our purpose.

C. Background and Origins:

What is now known as Central's CPI model began as an assessment initiative by President Elliott in 1985. After two years of definition and trial of traditional assessment programs, the faculty senate assessment committee began active involvement in goal setting, planning and resource allocation. Three important phases (1987-90) preceeded drafting of the preliminary proposal to FIPSE in October 1990. What happened in these preliminary phases are outlined in Decade of Transformation (Exhibit 3) and described in the body of the report, section C and exhibits 5 and 6.

After several years of exploration, experimentation and discovery, we became convinced that the "system always wins." In other words, unless real systems change occurs, reform efforts in higher education will lead to marginal, nondurable improvement. As the Faculty Senate Assessment Committee continued to probe the purposes, goals, available models and instruments for assessment, we found few convincing answers or role models. Too often people and institutions were using assessment instruments without questioning what they were trying to measure and why? Our search for universities who effectively used assessment evidence to improve the student learning process was discouraging. Most failed to understand the importance of, or actually make the connection between, assessment and improvement of student learning and process. This paucity of role models or benchmarks oddly opened our eyes and stiffened our resolve to find a comprehensive model that measured the right things and systematically improved student learning. We would not be pressured into doing something that didn't make sense. We would not pretend to see new clothes on a naked emperor just because others did.

D. Project Description

The CPI model is based on integration of the principles of Alverno's assessment-as-learning and industries' quality management. The CPI model is student learning centered, outcomes-driven, performance-based and is integrated by continuous assessment and feedback (Exhibit 2). This project, described as Phase IV of a five phase Decade of Transformation, 1988-1998 (Exhibit 3), was designed to demonstrate fundamental systemic reform in a pilot postsecondary educational institution. Phase IV, the FIPSE project (1991-94), thus built on several years of exploration, discovery, experimentation (research), faculty education (cultural change), policy development and planning.

E. Evaluation/Project Results

The CPI project was very successful at increasing both faculty and student awareness and understanding of the CPI model. Over the last four years approximately 70% of Central's faculty have received some type of training in CPI. A significant proportion (10-15%) have received extensive training in assessment-as-learning and/or total quality management. Through the use of regular university, college, and department level workshops and retreats, faculty are now equipped with new pedagogical and assessment techniques. The academic calendar now includes 6 days each year for planning and development. Approximately 40% of Central's faculty have added performance-based assessments to their classes since the beginning of the CPI project. Students are engaged in a much greater variety of learning/assessment exercises in their major courses than previously. Over 5,400 students have been exposed to CPI through special workshops, speeches, articles, and in class discussions. All incoming freshmen and new faculty receive a formal introduction to CPI during fall orientation.

Phase V (Exhibit 3) outlines Central's plans for continuation of the CPI project which basically calls for the institutionalization of CPI. Major goals include restructuring of the university, revision of budget/resource allocation process, adoption and utilization of CPI principles in remaining major programs and university studies, and development of a seamless PK-16 system.

Central's conspicuous successes have been in 1) raising the awareness and understanding of students and faculty about the nature of learning and teaching, 2) changing the university culture, 3) raising the expectations of faculty and students, and 4) demonstrating that a paradigm shift is possible in higher education.

Central has been less successful at producing documentation of changes in student learning. The focus of this project was transformation. Our long term goal is to produce externally validated, performance-based evidence of improved student learning for its graduates. It will take approximately three more years until we have a sufficient data base to allow us to demonstrate improvement in student performance.

F. Summary and Conclusions

In summary, the strategic intervention to penetrate the Central Missouri State University system succeeded and we are proceeding to implement Phase V (Exhibit 3) -- generalization and implementation of CPI throughout the entire university system. At the same time we have applied to FIPSE for a dissemination grant to work with eight adapting institutions to develop additional exemplars for systemic reform of universities. This next phase (V) will make possible comparative testing of the CPI model against the course-credit model.

Title: A Continuous Process Improvement (CPI) Model for Postsecondary Curricular and Pedagogical Reform Based on Assessment-As-Learning

Body of Report (20)

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A. Project Overview.

Central Missouri State University (Central) proposed to FIPSE to develop a transformational Continuous Process Improvement (CPI) Model and to implement this CPI model in ten academic departments in three years, 1991-94. The project was expanded to 15 departments in 1992 (Exhibit 1). The CPI model is *student learning centered, outcomes-driven, performance-based* and is *integrated by continuous assessment and feedback* (Exhibit 2). The FIPSE project, Phase IV (1991-94) of a *Decade of Transformation* (Exhibit 3), built upon several years of exploration, discovery, experimentation (research), faculty education (cultural change), policy development and planning. The project was driven by, and evaluated against, ten explicit *goals* for each participating academic department which are reported alongside of *results* in Exhibit 4. These results are elaborated in section E, evaluation, of this final report.

The answer to the question: "Who was served by this project?" is still developing. Initially, the faculty of the ten self selected academic departments (13 major programs). Then, students majoring in these programs. Next, the faculty in other departments especially those involved in development of Central's new university studies program. Employers and alumni, who volunteered to review and validate student learning outcomes developed by departmental faculty for a major program, were next. Finally, professional staff and non academic administrators were influenced as the mission was sharply focused on the University's core learning process. The espoused mission became a highly consensual mission-in-use. In other words the organizational culture changed to a focus on student learning, explicitly driven by performance-based learning outcomes, integrated by systematic and continuous assessment and feedback.

B. Purpose/ Problem.

1. **Problem.** What was the problem? "Reform in higher education has just been pruning the branches of a dead tree (O'Bannion, 1995)." "It's the system stupid (Mullin, 1994)!" A thorough review of the failures (anamolies) of higher education that led to the development of the CPI model is presented in pages 1-5 of our 1991 proposal to FIPSE. This review provides clear evidence of paradigm failure but no examples of paradigm change in higher education. One lesson learned is that the first step in creating a quality system is to consciously and explicitly examine the logic of the assumptions underlying the existing system. This conviction, that real reform requires breakthrough thinking, has been strengthened by our experience. Our understanding of the problem has not fundamentally changed but has elaborated and deepened.

2. **Purpose.** The purpose of this FIPSE project was to **develop** and **pilot** a model for postsecondary curricular and pedagogical reform; and, to disseminate the model and

results to appropriate forums as a guide to reform in higher education. The **model** was conceived as an alternative paradigm to replace the 100 year old course-credit-completion paradigm. The **pilot** was to test the feasibility of implementation to determine if university faculty would accept such radical and labor-intensive change and provide leadership for the next phase of system-wide reform of a complete university. Transforming one institution requires transcendent leadership, tireless effort and patience. If that was our only purpose, however, the project would not have been justified. Our long term purpose was and is to be a major influence in changing the prevailing paradigm and thus university systems throughout the United States. We believe only systemic change is durable. This conviction has been strengthened by our experience. Setting up the next phase (Phase V), which includes leadership to develop a set of exemplar institutions, was also an important element of our purpose.

3. **Potential for adapting** In preparing the FIPSE Dissemination Grant Proposal, now under consideration, we discovered a high level of excitement for systemic change from the eight adapting institutions recruited. Several were quite familar with Central's CPI model. The balance quickly saw the validity of the model and applicability to their need for quantum improvement in student learning. Before the project has even reviewed these schools are proceeding with plans. John Bigelow at Boise State has cleared his release time and has secured commitments of key chairs to proceed. Andrea Leskes, Northeastern University, has developed a presentation on the dissemination project (inviting us to participate, at the National Council of Colleges of Arts and Sciences in November. Three schools, Babson, DePaul and Samford, are participating with Central at an AACSB Continuous improvement Symposium in Philadelphia in October. There is genuine leadership for systemic reform here. The CPI model and Central's experience appears to be an effective catalyst.

4. **Lessons Learned**

a. Paradigm/Core Process. Reform programs must challenge the fundamental structure of higher education. The course credit completion model is more a device for making teaching easier than for improving learning. Universities have failed to be effective learning organizations and much of that failure is attributable to the course-credit model. Simply overlaying TQM principles over the flawed course-credit structure will fail to produce lasting change in organizational culture and behavior. A theoretically-sound model of the core learning process is a necessary condition for reform.

b. Principles. The assumptions of AAL and principles of TQM provide invaluable guidance; they only instruct practice, however, and must meet what we call the three test--interpretation, integration, and implementation. For example, "focus on customer" must be **interpreted** and understood in a comprehensive way as meaning anyone whom you serve, who uses or benefits from the value of your effort. If one narrowly interprets this principle to simply identify the student or the employer as the customer, the principle has lost its power to explain and guide. We found failures were invariably a result of not attending to all relevant principles simultaneously (**integration**). TQM is not simplistic; it is complex and requires systematic application. Quality results are still dependent on quality

implementation. TQM is not a magic formula. Careful focus on implementing the details is still necessary.

c. Leadership. It takes both, top-down and bottom-up leadership. In higher education, faculty must lead--faculty who value learning, teaching, and service enough to want to improve. Right motives are essential when asking people to transcend their self interests and do the hard work of reform. Faculty leaders will be most respected by other faculty if they are viewed as independent and internally motivated. Top-down leadership, however, must empower faculty to lead, encourage innovation, and provide funding and freedom to experiment.

d. Focus. We learned to fund hot spots of energy, concentrating time and money on faculty teams that were producing results. Energy was not wasted on faculty who refused to be open to logical argument and change.

e. Patience. Torbert (1992) suggests one reason TQM fails is because it requires "multiple transformation phases over a decade of time." Planning must be done in terms of decades. Reform leaders must emphasize there is no quick fix. Cultural change, involving everyone in an institution, will demand patience and transcending leadership.

f. Money. Seed money, in our case from FIPSE and Central, may be necessary to overcome inertia, get new processes going, and flexibly fund hot spots of energy. External funds also strengthen credibility.

g. Training. The need for training is constant and eternal. At each progressive stage, more and more skills and knowledge are needed and sought by faculty.

h. Faculty Involvement. We learned faculty will make quality improvement succeed or fail. Faculty make design and implementation decisions. The CPI project is faculty owned. Project directors are only coordinators and facilitators. Decisions made collaboratively by faculty in departments result in intrinsic motivation for change, improvement, and renewal. Faculty must lead!

C. Background and Origin of Model.

1. **Background:** Central Missouri State University is a comprehensive university comprised of four colleges, 34 departments, and 11,400 students. Central is located in Warrensburg, a small town of 15,000 only 50 miles southeast of Kansas City. Central has grown from a State Normal School through three name changes. It is a leader in discipline-specific accreditations within the Missouri system. Central offers a wide variety of undergraduate, graduate and education specialist degree programs.

When Ed Elliott began his tenure as president in 1985, the organizational culture might have been described as low in trust and openness, suspicious of administration, individual competitive, perception of the reward system as political. The result was that faculty

avoided risk and high performance behaviors including reluctance of faculty to assume responsibility.

In 1985-86, Central, in response to calls by state government for greater institutional accountability established the following: (1) assessment of math and writing skills of entering freshmen for placement; (2) a writing-across-the-curriculum program; (3) assessment of writing in the English department; (4) further development of Central's Educational Development Center. During the same time period, Central's Faculty Senate also established an assessment committee. As this committee worked on developing an approach to assessment, members became increasingly frustrated by: (1) requests for a test to assess a major program for which faculty could not clearly define the **outcomes** to be assessed, (2) the **lack of congruence** between the content of standardized tests and content being taught (content and construct validity), and (3) the lack of **usefulness** of standardized test results either to improve student learning **or** to evaluate programs. Over and over again members raised the same questions: "What is it that we should be measuring? Why? And to what end?" This increasing frustration served to clarify the needs for: (1) an explicit definition of the **purpose** and ends of assessment, (2) explicit **outcomes** of student learning, and (3) a comprehensive assessment **model** to explain the complex learning and assessment process. In the fall of 1987, the committee began an intentional search for a model and funded the first phase of a program of experimentation. (Exhibits 5 and 6).

2. Model Discovery and Development, June 1988-June 1991

This three-year phase was characterized by: (1) discovery of a sound model, (2) faculty exposure, understanding, and acceptance, (3) experimentation with alternative assessment methods, (4) discovery that the principles of total quality management (TQM) and assessment as learning (AAL) are highly congruent, (5) recognition that a fundamental cultural change was evolving which would require multiple transformation phases, and (6) design and development of goals, strategies, and program.

The search for a sound model to guide reform quickened in June 1988 at the AAHE Third Annual Assessment Conference upon discovering Alverno College's assessment-as-learning approach. Focusing on student learning resolved **purpose** or mission. Understanding assessment as an integral element in the learning process itself, coupled with Alverno's logically sound set of assumptions (Exhibit 26), provided a clear conceptual basis for a **model**.

Although a few faculty received the model positively, most did not grasp the profound implications of the assumptions and the comprehensiveness of the model. Recognizing that changing faculty's basic assumptions about learning would be difficult and time-consuming, the assessment committee made faculty exposure to assessment experiences a priority. Over 50 faculty participated in a variety of assessment conferences in the next two years. By fall, 1989, the committee framed a set of principles defining assessment at Central, and sponsored two important on-campus conferences: a series of seven meetings conducted by Peter Ewell, involving over 200 faculty; and, a three-day assessment-as-learning workshop conducted by a team of four faculty from Alverno with 125 faculty participating. Sixty-seven selected faculty, representing four colleges and seventeen

disciplines, have received intensive training at week-long Alverno workshops. Forty-seven of these were prior to the beginning of the FIPSE project -- four in May, 1989, seventeen in June, 1990, and twenty-six in June, 1991 (Exhibit 5).

An experimentation program was planned using two sets of measures developed by the American Assembly of Collegiate Schools of Business's (AACSB) Outcomes Measurement Project (1987). The purpose of the experimentation program was to learn more about **testing** versus **performance-based assessment**, and the **usefulness** of each for both student learning and program evaluation. The results of the traditional test over a common body of knowledge yielded no significant difference between means from comparable schools; thus, no data useful for either program evaluation or student learning resulted. The performance-based assessments were used in three phases: (1) a one group pre-/post- design with 35 students, fall semester 1988, (2) a Solomon four design test with 276 students, spring 1990, and (3) an application of assessment methods in fifteen different courses in four colleges, 1990-91 school year. As an example of how the faculty educational effort interacted with the experimental program, faculty who taught the fifteen courses in Phase III were the evaluation team for the Phase II research. The evaluation team committed to attend the five-day Alverno workshop, teach a course using AAL methods (Phase III), and later mentor other faculty in Phase IV (CPI/FIPSE project). The empirical results of the two field experiments, reported in Managerial Skills (Mullin, Shaffer & Grelle, 1991), were highly supportive of the general hypothesis that students can develop complex skills in an academic setting while learning content knowledge. These results conveyed that our approach to assessment and reform was scholarly and rigorous.

From 1986 to the present leaders in assessment were brought to campus in an attempt to raise faculty and staff understanding of assessment, pilot assessment-as-learning projects were conducted and faculty interest in assessment grew. In 1990, the discovery of the striking conceptual similarities between TQM (Exhibit 2c) and assessment as learning (Exhibit 2b) enriched our thinking about a model and how to effectively communicate with employers. By early fall, 1990, we outlined a strategy to design and implement a model of AAL and TQM at Central. From the outset, the CPI model was intended as a potential replacement for the dominant Course Credit Model. The project began in the fall of 1991 with 10 departments committed to restructuring both the content of their majors and the means of instruction, based on the principles of the CPI model.

The FIPSE project team represented all four of Central's colleges (seven faculty, two assistant deans) and three professional staff departments. All had been heavily involved in Phases I through III. Each member has a clearly defined area of responsibility. These ten provided the support structure, service, and coordination for the ten departments where faculty developed the ten components of the project.

D. Project Description.

1. The CPI Conceptual Framework:

Central's CPI model builds on the ten assessment-as-learning (AAL) assumptions

developed by Alverno College (Exhibit 2b). TQM principles (Exhibit 2c), which are highly complementary with AAL, provide additional underpinning for the CPI model and provide functional terminology for communicating the CPI model to employers. This section of the paper describes the major elements that comprise the CPI model: the organizational mission, the core process criterion, and the core process design. The CPI model is then described in terms of changes in the framework of higher education.

Organizational Mission

The TQM literature emphasizes that organizational change begins with re-envisioning the mission. The mission must clearly define a simple, focused purpose of the organization's existence. This purpose in turn will provide the basis for the design of the core process. The process of collaboratively re-envisioning and consensually agreeing on the organizational mission is as important as the mission statement itself. As the TQM literature suggests, such an organizational mission will provide direction and motivation only if it is individually and collectively valued. The mission sets the stage for re-thinking strategies, while the process of collaboration provides a means for participants to own the implicit set of values the mission represents. The first assumption of AAL embraced in Central's CPI model is that **student learning** is the university's mission, its primary purpose. Successful implementation of CPI depends on faculty, staff, and administration consensually valuing this singular mission focused on student learning.

Core Process Criterion

The university's core process is the system by which the mission, student learning, is accomplished. The utility of the core process lies in its ability to produce outcomes consistent with the mission. In the CPI model, the faculty of each major program specify the criteria for the core process in terms of a comprehensive set of performance-based student abilities, or "outcomes". The outcomes involve complex abilities which integrate knowledge, skills, and attitudes (KSAs). These outcomes define the desired "ends" of the core process, focus all learning activities and methods, and are the criteria for measuring the effectiveness of the core process (Exhibit 2b, Assumption #2). Faculty take ownership through the consensual process of defining both general and specific outcomes. Articulating the outcomes and making them public allows other important constituents (employers, alumni, graduate schools, etc.) to participate in outcomes validation and to share ownership (Exhibit 2b, Assumption #9).

Core Process Design

The CPI design for classroom learning, established on principles of AAL, involves faculty and students. Faculty: (1) define performance-based student abilities to be learned and demonstrated in the course, (2) write criteria which specify the expected characteristics and quality of performance for each ability, (3) observe student performance based on the stated abilities and specific criteria, (4) assess student performance based on expert judgment, and (5) provide developmental feedback to the student against the specific criteria. Students: (6) process the feedback cognitively, and (7) repeat the performance. The CPI design of the core process is

depicted in Exhibits 2a and 2d). This learning process is supported by most cognitive and behavioral learning theory, (e.g., Bandura, 1977; Luthans & Kreitner, 1985).

In the CPI model, students acquire complex abilities developmentally when they "make an action out of knowledge" based on specific performance criteria, receive feedback based on expert judgment, and cognitively adjust to improve their subsequent performance (Exhibit 1, Assumption #6). Students learn from repeated opportunities to practice desired abilities in various situations and contexts. These multiple experiences facilitate the retention of knowledge and the transfer of abilities to new situations at higher levels of generalization (Exhibit 2b, Assumption #5).

Observation and assessment of student performances is not only a series of discrete measurements, but a continuous and integral part of the students' learning process design (Exhibit 2b, Assumption #4). Assessment produces feedback as a part of a continuous improvement process for each individual student. Because general outcomes involve multidimensional, complex abilities, students must perform and be assessed in a variety of modes and contexts. (Exhibit 2b, Assumption #5)

In the CPI model, courses and sets of courses (curriculum) are the **means** that provide a structure for student learning. Each course is developed as an element in a coherent curriculum, structured so that students acquire complex abilities developmentally across courses. Although feedback from student performances guides student learning, it also provides information for continuous review and improvement of courses and curriculum (Exhibit 2b, Assumption #9). Creation, maintenance, and improvement of a coherent curriculum is iterative, continuous, and dynamic (Exhibit 2b, Assumption #8). Management of the curricular process depends on faculty investment in a community of learning and judgment (Exhibit 2b, Assumption #7).

CPI Paradigm Shift

Degree requirements drive student and faculty action in the learning process. In the traditional course-credit model, degree requirements are stated exclusively in terms of required courses. The set of required courses serves as the criterion for the core learning process, as the organizing principle for structuring the major program, and as the end of the educational process. Since the course credit criterion provides no systematic mechanism to coordinate and integrate student learning developmentally across the curriculum, courses typically evolve as discrete packets of content knowledge. Neither faculty nor students have the means or the impetus to transfer or generalize knowledge and skills from one course to another.

The CPI model shifts the measure of student competency and the organizing principle for the degree program from the completion of courses to the demonstration of performance-based abilities. In the CPI model, the required curriculum becomes a means for systematic, developmental student learning while performance-based student abilities are its ends. Changing the role of curriculum from ends to means is subtle but profound. It is a paradigm shift which compels at least eight fundamental, systemic changes in program design and pedagogy.

First, the CPI description of the major in terms of ability-based performances provides

a **common organizational principle** for faculty and student action. Individual courses are unified around performance-based abilities that describe the major program, such that complex communication, interpersonal, thinking, valuing, and technical skills are learned developmentally across a variety of context and content specific courses.

Second, the CPI public articulation of the performance-based abilities allows **involvement** of all "customers and suppliers" in designing the learning process. All interested constituencies, including students, alumni, employers, and other faculty can review and assess outcomes for relevancy and importance. The outcomes also provide the means for developing relationships with elementary and secondary educators (suppliers).

Third, the CPI emphasis for student learning shifts from the recollection of content knowledge to student demonstration of an integrated set of knowledge, **skills, and attitudes (KSAs)**. This shift in emphasis enhances the value of "content knowledge", by promoting learning at the higher level of understanding. The preeminence of student performance is consistent with the AAL Assumption #2, "Education goes beyond knowing to being able to do what one knows" (Exhibit 2b).

Fourth, the CPI focus on student abilities forces systematic consideration of the developmental nature of the learning process. Curriculum, as the "means", must be designed to foster student progress from basic to more advanced proficiency levels, and to engender student learning of complex abilities as a developmental process. By understanding the performance-based abilities expected of them, students are better able to recognize how skills and knowledge are to be transferred and developed across courses. The public statement of these abilities provides an explicit road map to guide individual student learning, thereby increasing both the **opportunity and motivation** for students to learn.

Fifth, CPI, allows **co-curricular learning** activities to directly complement formal course work. Leadership of student organizations, internships, developmental seminars, work experience, and other campus activities provide valuable learning opportunities which contribute to the development of desired student abilities. Instructors may help students to identify appropriate co-curricular learning opportunities related to student performance expectations and individual student abilities.

Sixth, CPI makes **assessment** an integral, continuous part of the learning process instead of inspection and a grade at the end. Assessment is a continuous process, not a series of discrete steps. Expert judgment based on the observation of student performances provides feedback for performance improvement. Students learn to regard assessment of performances in terms of constructive opportunity for improvement rather than as a mechanism to determine a grade.

Seventh, and most importantly, CPI encourages change in classroom **teaching methods**. Instead of learning exclusively "about" the content knowledge related to a discrete course, students must learn to apply, assess, and reflect on content knowledge in a variety of contexts.

Eighth, Although CPI **feedback** is primarily used for individual student development, faculty also use feedback. Over time, the observation of student performances provides rich information about the relationship between student performances instruction, and curriculum to continuously improve the core process.

These eight fundamental differences are summarized in Exhibit 4, which presents a comparison between CPI and the course credit model. These differences require major changes in faculty values and behavior, and the organizational culture.

2. Implementing the CPI Model

In January, 1991, FIPSE invited a final proposal, requiring us to develop details on the design, goals and program. Decisions could not be made on many of the goals without actually gaining commitments from all faculty in participating departments. A draft proposal was sent to all 34 departments inviting them to consider participation. Preliminary meetings with department chairs were followed by meetings with the entire faculty of departments showing interest. Faculty were asked to read the preliminary proposal in advance to better understand specific commitments. Ten departments (twelve academic majors) with balanced representation from the four colleges (three majors from each college) volunteered. As faculty experienced success, the number of departments involved was to increase. This broad involvement of faculty, an essential TQM principle, was a key to success.

From March to September, 1991, planning proceeded on the assumption the FIPSE grant would be approved. Before FIPSE approval in September, much of Central's matching money ($50,000) had been committed for training and release time for the 12 departmental project coordinators. The project was launched. The 14 departments, 19 programs, and 200 faculty, including second year additions (1992-93), are shown in exhibit 1. The goals of this three-year phase (1991-94) are shown in Exhibit 4.

New initiatives in year two (1992-93) included expanding the project by: (1) adding eight new programs, (2) decentralizing by greater involvement of the college deans who now meet with their CPI chairs and departmental project coordinators monthly, (3) initiating CPI/TQM training and planning with administrative departments, (4) developing a **preferred supplier** program with high school principals and teachers, (5) faculty participation in industry TQM training programs, and (6) further development of customer relations guided by a Quality Advisory Team from TQM companies.

E. Project Results/Evaluation.

Central's original FIPSE proposal listed ten goals the project was to address. Since CPI is a systems reform model, these ten goals focused on changes in the system. Thus focus on faculty learning and change. Although Central's long term goal is to produce externally validated, performance-based evidence of improved student learning for its graduates, the FIPSE project goals centered on the necessary prerequisite for such improvement, reform

of the system. As Motorola's Bob Galvin (1993) asserts, "First one must have a quality system in place. Then one must measure the right things." Our results accordingly are primarily "process" results. This section documents the process changes at Central in the ten goal areas described previously.

The evaluation of the project was conducted by Central's Coordinator of Assessment and Testing Services. The Assessment Coordinator reports directly to the Provost and worked closely with him during both the formative and summative stages of the evaluation. A

one-page summary of results to date on the ten components for Phase IV (1991-94) is presented in Exhibit 4b.

GOAL 1. Model.

Results. In 1991, Central committed to the Fund for the Improvement of Postsecondary Education (FIPSE) to design, introduce, and implement the CPI model in "ten academic departments and fourteen major programs on four colleges." In Three and one-half years, nineteen departments and twenty five programs are directly involved in the process of implementing the model (Exhibit 1). Others, not formally involved in the FIPSE project, are now in full gear, e.g., Agriculture, Marketing and Legal Studies, Graphics. These departments represent over 45% of the faculty at Central Missouri State University.

In addition to the implementation of the CPI model in the aforementioned departments, Central has expanded the model into its general education (university studies) program as well (See Exhibit 7) for a description of a proposal recently submitted to our Coordinating Board for Higher Education to expand CPI into university studies.). This extension of the model was not part of the original ten goals but was a natural byproduct of the CPI implementation process. As more and more departments became involved in CPI, the need to extend the model to include university studies was recognized by the faculty. Our revised university studies program establishes exit performance-based competency levels in the four general outcomes of thinking, communicating, valuing, and interacting for all students. All faculty scheduled to teach in the revised program, which begins the summer of 1996, must teach to and assess at least two of these four outcomes using CPI principles.

Results from a survey distributed to faculty in CPI/FIPSE departments/majors suggest the cultural intervention is working in terms of attitudinal and behavioral change (Exhibit 8a). The questionnaire consisted of 34 statements. An examination of the responses on the first 15 items indicated a high degree of understanding and support for the CPI project by faculty. On a scale of 1-5 (Strongly Disagree - Strongly Agree), the average faculty response to items 1-10, 12, and 15 was over 4.10, indicating consistent agreement, understanding, and valuing of the CPI principles by faculty.

Items 16-34 provide a measure of the degree of actual involvement in the new teaching/learning practices by the faculty from both the individual and group (department) perspective. The strongest point of agreement was for item 16, which measured the degree to which faculty/departments had collaboratively developed outcomes for their programs (mean of 4.11 and 4.19 respectively). This was as expected since define

outcomes as a first step. The differences between the responses by the faculty given from the perspectives of self and department were negligible, suggesting that the faculty perceived their participation in the project to be equal to that of the other members of their department. These results provide evidence of the collaborative nature of the outcomes development/validation process.

Another significant CPI offshoot has been the application and use of the CPI model by various important committees, task forces, and administrative units. For example, the Strategic Planning Council, which is charged with establishing the institution's long term goals and strategies, has adopted several long term objectives that are a direct outgrowth of the CPI model. For example, the Council is recommending a change in the reward system that would allocate additional resources to **departments** which can provide evidence of improved student learning towards either departmental or university studies outcomes. The departmental Annual Reports have been revised and now require each academic department to report progress on the development and implementation of departmental outcomes, assessment methods, pedagogy, curriculum matrices, and faculty development. The Student Information Systems task force will use CPI principles to restructure the student data base. The use of CPI to rework the student data base will result in a major shift in what the university as an institution considers to be important student information (Exhibit 9). A Quality Self Assessment team has begun the process of performing a rigorous self assessment of the entire institution using the seven Malcome Baldridge National Quality Award criteria. Official university commercials and publications used to attract students, refer to CPI as **Central's** model of learning and teaching (Exhibit 10).

Evaluation. These and other results indicate that Central has made tremendous progress towards institutionalization of CPI (a major purpose of Phase V). We have clearly accomplished our first purpose - developing and implementing the CPI model at Central.

Another purpose was to show that a comprehensive university can initiate and maintain a systemic reform effort. The evidence to date would indicate that fundamental changes in both the structure and processes of a university are possible. Central has demonstrated the commitment and capacity to transform the learning process and restructure the university.

GOAL 2. Outcomes.

Results. Faculty in nineteen departments have collaborated to produce a set of student outcomes for their majors and validated these outcomes with a representative set of customers, e.g., graduates, students, employers, experts. An additional three to five departments are expected to develop, validate, and publish program specific outcomes for their majors in the 1995-96 academic year.

As previously mentioned, the Faculty Senate University Studies Committee has established a set of general outcomes for all our undergraduates. These outcomes will be taught and assessed using CPI principles.

The Financial Aid Office and several departments in the Student Affairs division have

established outcomes for their units through use of customer needs analysis.

Evaluation. Although not all of Central's 34 departments have established outcomes for their programs, much progress has been made in improving the relevance, cohesion, and direction of a significant number of major programs in a three-year period. By the end of next year, over two thirds of Central's departments will have developed and validated outcomes for their programs. In addition, Central has developed general education outcomes that will be taught and assessed using CPI principles.

GOAL 3. Assessment.

Results. Both students and faculty report a striking increase in the number of "products" or demonstrations of active learning, e.g., oral-visual presentations, writing assignments, portfolios, team projects. A second questionnaire was completed by 460 students at Central (Exhibit 8b). This instrument attempted to measure the student's personal agreement/disagreement with statements that indicated the learning/assessment activity of the faculty in their majors. Basically this survey provided a direct measure of the teaching/assessment practices of the faculty who taught the courses in the major. The results indicated that the students engaged in a variety of learning/assessment exercises in their major courses. The areas of highest involvement were in the use of assessable products (e.g., projects, presentations, and portfolios), oral and written assignments, and exercises that used higher order thinking skills. The students also reported that their instructors had developed explicit outcomes for their courses. These data suggest that the perceptions and experiences of the students, both in and out of the classroom, were positively affected by CPI.

This coming academic year, a faculty team will complete and pilot test a comprehensive entry (Freshman), performance-based assessment of the four general outcomes which drive the new univ3\ersity studies program. The comprehensive assessment is scheduled to be used in the fall of 1996 to establish baseline levels for incoming students and to identify their strengths and weaknesses for placement purposes. Within the next three years, Central will develop comprehensive midpoint and exit assessments of the four university studies general outcomes as well.

This Fall of 1995 Central will implement a planned placement program designed to match courses with a student's particular knowledge and general skills level in order to improve student learning.

A new requirement, not one of the original ten FIPSE goals, is that each department will utilize a departmental advisory council or board as one means of focusing on customer assessment and feedback. This is a partial operationalization of quality function deployment (QFD) an important TQM idea. Most of the CPI departments have established advisory councils, or are in the process of doing so. Council members, the voices of the customers, have been actively involved in comprehensive assessment of students in their major. Several of these assessment experiences have stimulated employers, students, and faculty in ways not thought possible before CPI.

Evaluation. We have not met our goal as originally stated. We had hoped that all

departments formally involved in the CPI project would have developed and implemented comprehensive assessments for their programs by this time. The development of comprehensive assessments remains a priority and we expect that all of the nineteen departments currently participating in CPI will have completed midpoint and exit assessments by the end of the 1996-97 school year.

GOAL 4. Curriculum.

Results. Fourteen programs have developed and evaluated a curriculum matrix which describes when and where course outcomes (knowledge, skills, and attitudes) are to be taught and assessed in the major. These matrices reflect changes in course content, both knowledge and skills, brought about by the outcomes identification/validation process. Twelve of these departments have developed an orientation course for students entering their programs that prepares the student for this new learning paradigm. Several of these departments have also developed publications which are distributed to students as they enter the major which describe the program's goals, philosophy, and assessments.

The Faculty Senate University Studies Committee hopes to have a curriculum matrix for the university studies program completed by the fall of 1996.

This year, all new faculty and entering first time, full time freshmen will receive an orientation to the CPI model during fall orientation. These sessions will be led by Central's Coordinator of Assessment and Testing Services.

Evaluation. Considerable progress has been made in creating program curricula that are integrated, developmentally sequenced, assessable, and public. However, we still need to get the remaining departments to develop their matrices and, perhaps more importantly, we need to develop a means of auditing programs to ensure that the proposed curriculum is being taught and assessed in the manner described. This coming year, the Faculty Senate Assessment Council will perform departmental assessment audits as part of regular internal program reviews (approximately five to six per year) to determine if faculty are in fact utilizing teaching and assessment methods appropriate for the program's stated outcomes. A similar auditing process must be developed for university studies. The fact that all course proposals to the revised university studies program must include a description of how the outcomes are to be assessed and how the information from those in-class assessments is to be used to improve teaching and student learning is a major accomplishment.

GOAL 5. Pedagogy.

Results. Approximately 60% of Central's faculty have added assessment-as-learning exercises to their classes that are driven by general or program outcomes. Refer again to Exhibit 3 which describes the results of student and faculty surveys designed to measure changes in faculty and student perceptions and activities due to CPI.

Evaluation. More work needs to be done in both faculty development and administrative support of teaching in order for us to get the 80 to 85% compliance we feel is necessary

to succeed. We have not made enough progress in changing the reward system to truly emphasize excellence in teaching as a prerequisite for promotion and/or merit pay.

GOALS 6 & 7. Training/Faculty

Results. In the first three years of the project, Central held five university forums, two university planning retreats, and ten days of workshops for faculty. In addition to these centrally organized training sessions, most of the CPI departments established monthly meetings to plan and evaluate their progress towards the ten components. Over the last four years, approximately 70% of Central's faculty have received some type of training in CPI. A significant proportion (10-15%) have received extensive training in assessment-as-learning and/or total quality management. Sixty-seven of Central's faculty have attended a five day workshop on assessment-as-learning at Alverno College. Each year we have held a university wide two-day workshop on a variety of topics related to implementation of CPI. This past summer (June 16-17, 1995) the workshop focused on preparing faculty to teach in the revised university studies program. Over 85 faculty learned how to develop assessment-as-learning exercises for their classes and how to use the information from those assessments to improve teaching and learning. Three more workshops have been scheduled for the remainder of the year. As mentioned above, new faculty will attend a workshop on CPI as part of their formal orientation program.

Last fall, four faculty Outcomes Teams, based on the four general outcomes, were formed. These teams are the implementation arm of the University Studies Committee. The faculty teams directed monthly meetings for faculty (30-35) who were interested in developing expertise in performance-based assessment. By next fall, all faculty scheduled to teach in the revised university studies program should have received initial training in performance-based assessment.

During the course of the CPI project, over 200 faculty have collaborated with colleagues, alumni, employers, and professionals to define and validate outcomes in their majors, evaluate and revise curricular expectations, and develop outcomes assessments.

Evaluation. For the last three years we have attempted to add five days for faculty training and/or departmental planning to the academic calendar. Our goal is to eventually have two weeks set aside each year for planning and development. Training remains a high priority.

All training sessions organized and managed by the CPI team were formally evaluated as to process and product. An example is provided in Exhibit 11. The results of these evaluations were made public and were used to plan higher quality workshops in keeping with the principles of the CPI model.

From the outset we seriously underestimated the importance of faculty training and development. We did not anticipate either the amount that was needed or the difficulty in getting faculty to attend training sessions. Since the end of the first year (1992) we have placed tremendous emphasis on faculty development and are convinced that systems reform is impossible without it. We have made great strides in improving both the involvement in and attitude toward training on the part of our faculty.

GOAL 8. Students.

Results. Over 5,400 students have been exposed to CPI. Over 600 students attended special workshops developed by the project team. This fall, a team of students, sponsored by a faculty person in the Communication Department, will develop a CPI advertising campaign that will be used on and off campus to inform students and the public about CPI. It is hoped that this campaign will increase campus wide awareness of CPI substantially.

Evaluation. Our goal to educate students about CPI has been relatively successful as indicated by both campus wide and departmental student surveys, and student attendance at various workshops. However, our objective of being able to **document** increased student learning, and graduates who are better able to meet the demands of professional and graduate schools, employers, and the private and public sectors, has not been achieved. It will take approximately another three years before we have the CPI quality system in place to the degree we can collect comprehensive data on students relative to either the general or program outcomes.

GOAL 9. Co-Curricular.

Results. Approximately 600 students have participated in Central's co-curricular transcript program since the beginning of the CPI project.

Evaluation. Due to the fact that the CPI model has not yet been fully implemented, we have not been able to develop the co-curricular component to any significant degree. At this point in time we have mostly identified co-curricular offices and activities that can provide opportunities for relevant, experiential learning exercises for our students. We have not actually developed co-curricular exercises and assessments to the degree desired or possible. Currently, only field experiences (e.g., internships, practicums) in a few of our programs include systematic learning and assessment experiences guided by CPI principles.

GOAL 10. Dissemination.

Results. Over 120 presentations to state, regional, and national audiences have been made to date. Exhibit 12 provides a listing for just the project director. In addition, four major papers, thirty proceedings, five workshops at other institutions, and over 125 responses to inquiries have been performed. A cooperative learning venture with eight other institutions has been agreed upon and submitted to FIPSE as the basis of a dissemination grant.

F. Summary and Conclusions.

A paradigm shift has begun in higher education. Institutions on the leading edge will gain an advantage--just as in business. The continuous process improvement (CPI) model

is one viable alternative for reform. At least four reasons exist to draw from CPI as a guide to reform.

First, the CPI model strikes at the heart of the serious flaws in the course credit completion model. Since this paradigm powerfully influences all curricular and pedagogical decisions, a precondition for **fundamental reform** is to draw it into consciousness and examine it. The CPI model does this.

Second, the CPI model focuses on **system** versus individual improvement where W. Edwards Deming (1960) insists 85 percent of improvement potential exists.

Third, the CPI model as an alternative paradigm forces the educational process to be responsive to the ever changing needs of society, because it requires explicit definition of **student performance outcomes** as defined by both internal and external customers (faculty, students, alumni, employers, etc.). These outcomes provide an effective means coupled with extensive in-class and comprehensive assessment feedback for continuous learning and improvement--a fundamental assumption of assessment as learning and principle of TQM. The course credit model provides no comparable mechanism to drive continuous improvement.

Fourth, Central's CPI project, initiated and developed by faculty, is demonstrating that **faculty** will provide **leadership** for substantive improvement. The model assures, once accepted by faculty, their full interactive involvement. With faculty leadership and involvement, real reform that reaches into the classroom and affects student learning will happen, resulting in long-term change.

Central has sucessfully (1) piloted the CPI model in 19 departments and 25 programs (Phase IV); (2) secured commitment of faculty and administrators to continue to fully implement Phase V; (3) has won accolades for the effacacy of the CPI model from national leaders (Exhibit 13), and (4) has developed the plan and commitments for adaptation to eight potential benchmark institutions setting the necessary condition for a empirical test of the two models -- course-credit and continuous process.

PARTICIPANTS AND CONTACT PERSON

1993-94

Exhibit 1

COLLEGE	DEPARTMENT	FACULTY	PROGRAM	STUDENTS	COORDINATOR	PHONE NUMBER
Applied Science & Technology	Electronics Technology	9	Electronics Technology [2]	150	Clarke Homoly, TRG 318H	816-543-4980
	Graphics	16	Graphics [3] (3)		Malcolm Kelf, G108F	4726
Art Rosser, Dean	Human Environmental Sciences	(7) 4	Hotel and Restaurant Admin. [1]	150	Sandra Dassenko, G232	8737
G145	Manufacturing & Construction	17	Manufacturing [2]	100	Lyman Hannah, COT 101*	8593
Central Missouri State University			Construction [2]			
Warrensburg, MO 64093	Nursing	17	Nursing [1]	195	Julie Clawson, SHC 117	8305
816/543-4450	Power & Transportation 6/9	79 16	Power & Transportation [3] 9	1170 575	Ted Nicoll, TRG 210D	4081
Arts & Sciences	Chemistry & Physics	7	Chemistry [1]	40	Dennis Faulk, WCM 408	4949
	Communication	14	Journalism [1]	110	Carol Mills, MAR 136F	4609
Robert Schwartz, Dean		7	Organizational Communication [1]	95	Joe Mazza, MAR 136L*	8583
MAR126C	English	37	English B.S.Ed [1]	55	Gail Crump, MAR 336R	8665
Central Missouri State University	Mathematics & Computer	74 (23)	Math [2]	489 189	Terry Goodman, WCM 125	8792
Warrensburg, MO 64093	Science 4/11	9				
816/543-4750			5			
Business & Economics	Accounting	10	Accounting, BSBA [3]		David Joy, D 405E	8569
	Computer & Office Information		Computer & Information			
Paul Shaffer, Dean	Systems	14	Systems [3]		Kerry Henson, D 300F	8647
D212	Economics & Finance	10	Economics [1]	35	Mark Karscig, D-310C*	4817
Central Missouri State University		6	Finance [1]	170	Jose' Mercado, D-301B	8650
Warrensburg, MO 64093	Graduate Programs (COBE)	(10) 1	MBA [2]	180	Harry Poynter, D-108C	8571
816/543-4560	Internship & Co-op Ed.	1	Internship [2]	70	Bill Garber, D-102E	4632
	Management 4/5	54 12	Management [1]	540	Janet Winter, D-400C	8568
			Human Resource			
			Management [3] 8	1050 55		
Education & Human Services	Curriculum and Instruction	11	Secondary Education [1]	900	John Zelazek, LOV 300S	4235
		10	Elementary Education [2]	1100	Carol Mihalevich, LOV 209*	8731
Joe Huber, Dean	Special Services	4	Recreation & Tourism [2]	150	Bob Slana, LOV 201B	8932
LOV213	Speech Pathology & Audiology	8	Speech Pathology [1]	175	Marilynn Schmidt, MAR 137	4916
Central Missouri State University	Physical Education 4/8	45 12	Physical Education [1]	2505 180	Joyce Bailey, MAR 102	4172
Warrensburg, MO 64093						
816/543-4272			5			
Academic Services	Educational Development Center	10	EDC [3] 1	300	David M. DeFrain, HUM 120E	4792
TOTALS	19/35	444/262	150/28	11,500/5414		

Craig Christie, Executive-in-Residence, D 400G
Grelle, Michael, Psychology, LOV 112-B, 543-4208
Mullin, Ralph, Management, D-401E, 543-4818
Wilson, George, Economics & Finance, D-212C, 543-8597
Mees, J.P., Provost, ADM 203, 543-4116
Elliott, Ed, President, ADM 201, 543-4112

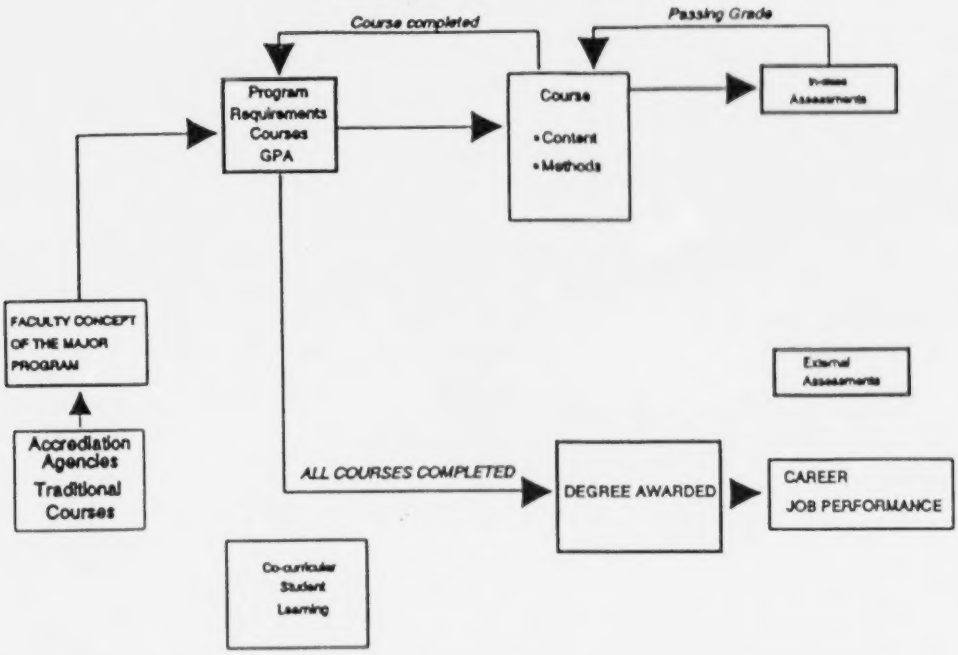
[1] First Year 1991-92
[2] First Year 1992-93
[3] First Year 1993-94

*College Assessment Coordinators

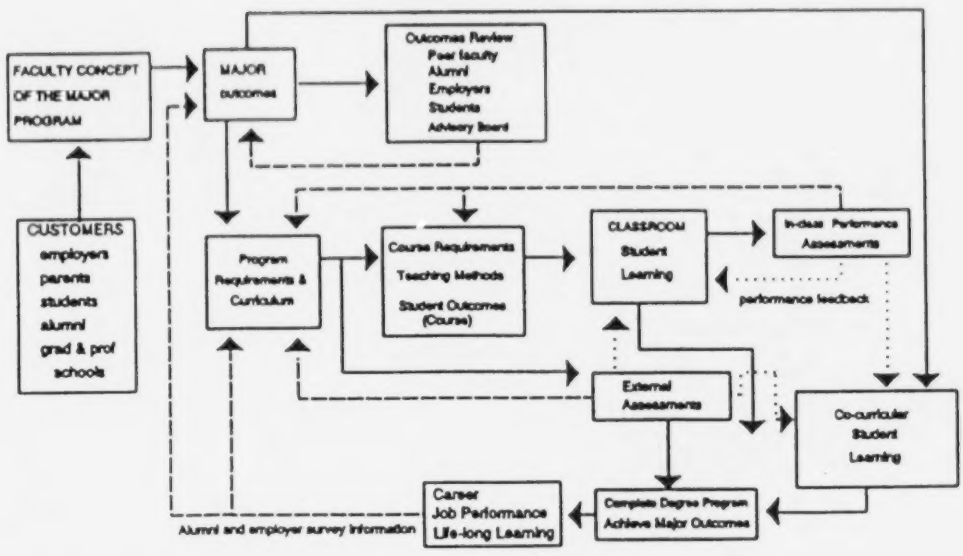
Exhibit 2a

ORGANIZING THE LEARNING PROCESS

Application of the Course-Credit Model



Curriculum Planning and Student Learning
CPI with Student and Program Feedback Loops



Process flow

Curriculum Feedback Loop – Information used to revise curriculum, courses, outcomes

Student Development Feedback Loop – Information used by student and instructor to improve student performance

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Student Learning and Assessment

1. Student learning is a primary purpose of an educational institution.
2. Education goes beyond knowing to being able to do what one knows.
3. Learning must be active and collaborative.
4. Assessment is integral to learning.
5. Abilities must be developed and assessed in multiple modes and contexts.
6. Performance assessment--with explicit criteria, feedback and self assessment--is an effective strategy for ability-based, student-centered education.

Curricular Coherence and Development

7. A coherent curriculum calls for faculty investment in a community of learning and judgment.
8. The process of implementation and institutionalization of a curriculum is as important as the curriculum; the process is dynamic, iterative, and continuous.
9. Educators are responsible for making learning more available by articulating outcomes and making them public.
10. Responsibility for education involves assessing student outcomes, documenting inputs, and relating student performance over time to the curriculum.

From the Consortium of Teaching, Learning and Assessment, funded by W.K. Kellogg Foundation, including Alverno College, Bloomfield Hills Model High School, Central Missouri State University, Clayton State College, Gallaudet University, Macomb Community College, Purdue University School of Pharmacy, South Division High School, Township High School District #214, University of Wisconsin Medical School, University of New Mexico School of Medicine.

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Exhibit 2c
Key Principles of TQM

TQM is a set of management principles and core values. While each of the founders of TQM (Deming, Juran, Crosby) define their essentials differently, there are common themes. We focus on four: 1) Customer focus; 2) Commitment to Continuous Process Improvement; 3) Involvement; and, 4) Systems thinking.

1. **Customer focus**: Customer satisfaction defines quality. Just as the value of a gift is defined by the receiver, quality is defined by the customer. Everyone in the system must identify and develop a working relationship with their customers. External customers are the receivers of your system's product or service. Internal customers are within the system e.g., students, the faculty instructor next in line who is dependent on what the student learns in your class. Internal customers are important in defining, assessing, and improving the process. Everyone should identify, define, measure, and meet the criteria for satisfaction of their customers. This begins when people make a deliberate effort to identify their internal and external customers. It matures when all customer-supplier relationships are well defined partnerships.

2. **Commitment to Continuous Process Improvement**: Everything is a process. TQM focuses on how each **process** can be improved. **Continuous improvement** assumes well-defined objectives, criteria, and measurement (assessment). This requires a deep personal and shared **commitment** to quality (excellence) which transcends other personal and short-term concerns; thus, the commitment is by nature enduring and strategic. This correctly implies the necessity of a fundamental cultural change in many organizations.

3. **Total Involvement**: Involvement goes beyond many earlier participatory management notions. It means more than encouraging cooperation, sharing responsibility, participation in some decision making, and working in teams. Involvement is facilitated by providing quality education and training initiatives which allow employees to learn and use skills which go beyond current job task requirements in order to redesign work processes. Involvement may be the key to simplifying processes. Involvement assumes everyone is a valued and competent partner who believes in and acts on the ideal of quality.

4. **System Thinking**: TQM asserts 85 percent of total error is "common cause variation" or "system error," only 15 percent results from individual performance. TQM is fundamentally different (paradigm shift) from traditional management which may be inordinately concerned with individual performance.

CPI Core Process Design

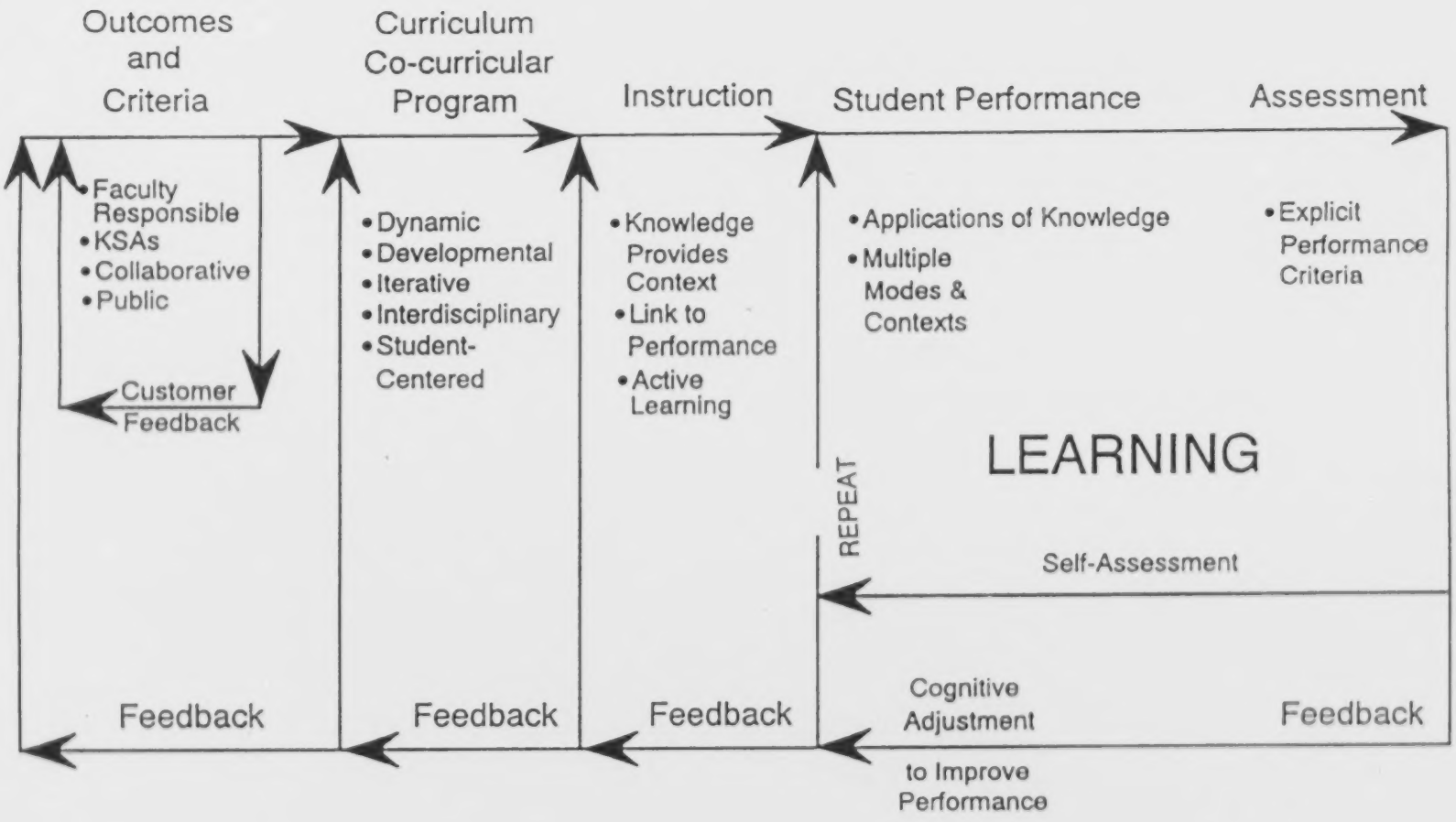

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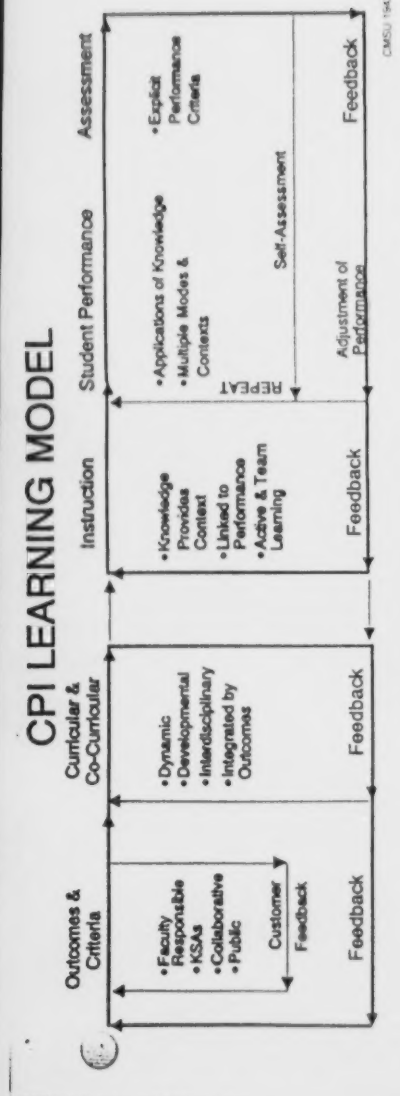
Exhibit 3

CENTRAL MISSOURI STATE UNIVERSITY
Decade of Transformation to Best in Class in Quality Education Worldwide

1987-89	1989-90	1990-91	1991-94	1995-2000
Phase I **Exploration**	**Phase II** **Experiment**	**Phase III** **Trial**	**Phase IV** **CPI Model & Cultural Change**	**Phase V** **Institutionalizing, Restructuring, & Influencing**
Assessment, Traditional **Entry: -Math** **-Freshman writing** **-Writing** **Seniors:-Business knowledge** **AACSB CBK Exam** **-Major Field Exams** **Assessment, Non-traditional** **Phase I Field Experiment n = 35** **Measures: AACSB/DDI** **Cost: $19,000** **Assessment, programs** **Writing-across-the-curriculum** **English project** **Faculty Senate Assessment** **Exploration and Discovery (6/88)** **of a Comprehensive Learning** **Model, Alverno's Assessment-** **as-learning** **$20,000** Faculty Training 5 Day workshop Alverno College n = 4 $4,000 Assessment Projects $100,000	1. Phase II Field Experiment n = 276 Measures: AACSB/DDI 4 Hypotheses 4 Groups $75,000 2. Discovery of TQM and Assessment as Learning Congruence 3. Faculty Training * 3 Day on-campus Assessment-as-learning 4 Alverno faculty n = 125 $10,000 * Peter Ewell on-campus 7 meetings, 400 faculty * 5 Day Workshop Alverno College n = 17 $20,000 4. Assessment Projects e.g., English, Nursing, Physical Education $52,000	1. Faculty (17) evaluated Phase II Research * Alverno training * Designed & taught courses * Mentored Department Faculty 2. Development of FIPSE Proposal 3. Development of the Continuous Process Improvement (CPI) Model 4. Faculty Training 5 Day workshop Alverno College n = 26 $30,000 5. Assessment Projects $68,000 6. Dissemination of Phase II results 7. Faculty Senate: Assessment Timeline	1. **CPI Model Design** CPI Project FIPSE $253,000 Central $223,000 $476,000 2. **Faculty Training & Buy-in** -University (5 forums,Retreat) -College (4 workshops) -Department (20 retreats) -Alverno, 5 Day (n = 16) 3. Implementation - Incremental Academic Colleges - 4 Departments 10 14 19 Programs (majors) 12 19 27 * Outcomes: General & Program - Definition, Validation, & General Criteria * Curricular - Evaluation (matrix),and change * Pedagogical Change, Faculty Development: Outcomes, Course syllabi, Performance experiences, Assessment * Assessment-Comprehensive * Faculty Involved/Empowered 150 200 300 4. Institutional Involvement in CPI: Faculty Senate Policies: * Adoption of Academic & Student Services Assessment Paradigm * Timeline Resolution for development of outcomes and assessment exercises 5. Dissemination: 100 Presentations	**A. RESTRUCTURING THE UNIVERSITY** 1. Re-engineering and restructuring of the University (Elliott, Christie, Mullin) 2. Training and development (Christie, Gould, Grelle) 3. Strategic planning (SPC, Mees) 4. Quality reward system (Shaffer) 5. Quality data system (Boyd, Karscig, Nimmer) **B. INSTITUTIONALIZING THE CPI MODEL: ACADEMIC FUNCTION (Mees, Council of Deans)** 6. Academic departments & major programs (deans, chairs) 7. University Studies program (Mees, Bailey, Grelle) 8. Learning/assessment structure (Grelle) 9. Learning/assessment support center (Gould, Rao, Wilson) 10. Academic Advisement (Feldman, Waller) 11. Honors Program (Viscusi, Waller) 12. Freshman year students (Patterson, Waller) 13. Educational Development Center (DeFrain, Waller) 14. International programs (Rodenberg) **C. INSTITUTIONALIZING THE CPI MODEL: SUPPORT FUNCTIONS (Vice Presidents)** 15. Co-curricular/curricular learning experiences (Krager) 16. Admissions--system inputs (Hudson) 17. Career development & placement--system outputs (Alewel) 18. Communication--external/internal (Inglish) **D. DEVELOPING A PK-16 SYSTEM (Mees, Huber)** 19. PK-16 reform model (Garten, Hudson, Mihalevich) 20. Teacher education (Garten, Zelazak, Mihalevich) 21. Professional Development Center (Peter) 22. Network (consortium) of PK-12 schools, universities, & community colleges (Huber, deans) **E. INFLUENCING OTHERS** 23. Influence partners 24. Leadership (dissemination)



The Continuous Process Improvement Learning System

- Student-Learning Centered
- Outcomes Driven
- Performance Based
- Continuous Assessment-Feedback

Because work organizations increasingly require quality thinking, communicating, interacting, and valuing skills, students often work in teams developing these skills.

Central MISSOURI STATE UNIVERSITY

Continuous Process Improvement and the Traditional Model

At Central all functions of the University are focused on improving student learning and providing students with explicit knowledge, skills, and attitudes (KSAs), rather than just grade reports. The table below compares the current, traditional system of education with a student-focused Continuous Process Improvement (CPI) model. The schematic model charts the complicated relationship and feedback loops for all aspects of the learning process.

Differences Between the Models

Traditional Model	CPI Model
Common Organizating Principle	
• Required courses are the basis for organizing the degree program. Individual courses evolve as discrete packets of knowledge because no set of comprehensive student learning goals exists.	• Explicitly defined performance-based student abilities are the organizing principles for curriculum and instruction. Outcomes require students to integrate knowledge, skills, and attitudes (KSAs).
Involvement	
• No mechanism systematically provides information and feedback from various constituencies.	• General outcomes are determined and validated by faculty, students, alumni, employers, and others.
Content Knowledge	
• Content knowledge, the usual focus of courses, is seldom demonstrated in active performance contexts, or transferred to other courses.	• Content knowledge provides the context for all learning. Students learn by doing and integration of past learning.
Curriculum	
• Curriculum is the *end* as well as the *means* for the learning process. There is no process to systematically connect learning across courses.	• Curriculum, the *means* for student learning, is coordinated by outcomes, creating a developmentally sequenced program of courses.
Co-Curricular Learning	
• Out-of-class activities are generally regarded as competitive with classroom work. Skill development in co-curricular activities is independent of course and degree requirements.	• Complements classroom learning. Outcomes provide connections between courses and co-curricular activities for knowledge and skill practice.
Assessment	
• Assessment fails to impact student learning because feedback is limited, easily ignored, and often viewed as irrelevant. "Objective," nonperformance-based measures are often used.	• Assessment requires performance of explicit outcomes and is an integral part of the learning process. In-class and out-of-class assessments are carefully sequenced and coordinated across courses.
Teaching Methods	
• Professors lecture; students listen, take notes, and read the text. Students are generally passive, their primary contribution being the recall of material on examinations.	• Students are learning *to do* rather than *about* the course material demanding involvement. Students must think, judge, decide, act, and create. Effective learning experiences include group learning, peer tutoring, and self-and peer-assessment against established criteria.

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CPI/FIPSE 1991-94

EXHIBIT 1C

GOALS

1. MODEL: Design, develop, and implement a Continuous Process Improvement Model for systematic curricular, pedagogical, program, and institutional reform. The model will focus on improved student learning through an assessment-as-learning approach.

2. OUTCOMES: Specify and adopt a comprehensive set of general and program-specific outcomes (knowledge and skill development) that will define entrance and exit requirements for thirteen major programs, ten departments, and four colleges. Evaluation of the entry level assessments will provide operational definitions for the general student outcomes for Central's general education program.

3. ASSESSMENT: Prepare and use learning exercises for in-course assessment of students' content knowledge and cognitive/behavioral skill development. Prepare and use comprehensive student assessment instruments and procedures to measure student development from entry through exit relative to explicit outcomes for thirteen major programs.

4. CURRICULUM: Design a new curriculum in thirteen major programs, create a curriculum matrix to integrate course content and expected outcomes, conduct a student orientation course to prepare students for the outcomes-based learning system, and implement a method and structure to continuously evaluate and modify curriculum based on feedback from student performance assessment.

5. PEDAGOGY: Demonstrate and increase the use of outcomes-focused, performance-based teaching methods. Use feedback from student performance assessment basis for modifying classroom exercises and techniques.

6. TRAINING: Forty hours of training in the basics of the CPI model and the eight components to be provided for participating faculty, plus advanced assessment training for at least two from each program.

7. FACULTY: Enhance the teaching skills of a large group of faculty (130) who have (a) collaborated with professionals in the field, alumni, and colleagues within and across disciplines to identify desired student outcomes; (b) evaluated and modified curricula and developed new teaching and assessment methods; (c) articulated both general and program-specific outcomes to students, faculty, staff, and external stakeholders; (d) demonstrated competence in assessor skills; and (e) become better teachers capable of mentoring faculty in the assessment center method.

8. STUDENTS: Develop 1,400-1,500 students who can (a) demonstrate the ability to articulate expected outcomes; (b) demonstrate competence relative to a set of specified performance outcomes; (c) provide potential employers assessment-center-type validations of knowledge/ability levels; (d) meet the demands of professional schools, graduate schools, and the private and public sectors.

9. CO-CURRICULAR: Establish a program which officially documents the student's nonacademic involvement and helps the student apply the principles of self-assessment to general intellectual skills.

10. DISSEMINATION: Final results to be shared, via 20 presentations and/or papers, with 20 national professional education organizations.

RESULTS

1. MODEL: The CPI model is being implemented in 17 academic departments, publically committed to by administration (Exhibit 3) and a critical mass of faculty (250 of 500). This focal core learning process model implements the university's mission and is the organizing principle for evaluation of all support functions.

2. OUTCOMES: General student outcomes have been developed and validated by 17 departments and 26 programs. All courses in the new university studies (Gen Ed) program address two of the four general outcomes and specify means of assessment. Program-and course-specific outcomes have been developed and validated by 18 programs. The college of business and economics has defined common BSBA outcomes and are in the process of validating. These will be the basis for redesign of the 45 credit hour core curriculum.

3. ASSESSMENT: Eight major programs have developed and administered comprehensive assessments for entry into the major. All departments are scheduled to have both comprehensive entry and exit assessments in place by 1997.

4. CURRICULUM: Twelve programs have created and evaluated a curriculum matrix which describes when and where outcomes are to be addressed in the major. Dramatic changes in course content have resulted. Twelve programs use an orientation course for students entering their programs that prepares the student for this new learning system.

5. PEDAGOGY: Approximately 60% of participating faculty added assessment-as-learning exercises driven by outcomes to their classes. A survey of students indicates increases in written assignments (100), oral-visual presentations (300%) and use of Team learning (400%).

6. TRAINING: Each department participated in 40 hours of faculty training per year. Training sessions have come in a variety of forms: university forums (5), university planning retreats (1), CPI team retreats (3), workshops (8 days), department retreats (17), and meetings (average 2 per month). Initial training served to educate faculty about the model whereas the latter has focused on implementation. In addition, 63 faculty from Central have attended a five day workshop on assessment-as-learning at Alverno College. A cadre of 70 faculty, members of one of four General Outcome Teams, are facilitators who train and mentor faculty teaching courses in the new university studies program to develop assessment-as-learning experiences and performance assessments. A workshop is planned for June 16-17, 1995 (see narrative report).

7. FACULTY: Over 200 faculty have (a) collaborated with colleagues, alumni, employers, and professionals to define and validate outcomes in their major, (b) evaluated and revised curricular expectations, and develop outcome assessments. Measurement of change in faculty teaching behavior is dealed in the narrative.

8. STUDENTS: Over 5,400 students have been exposed to CPI. Over 600 students attended special workshops.

9. CO-CURRICULAR: Over 500 students participated in the co-curricular transcript program.

10. DISSEMINATION: Over 100 presentations to state, regional, and national meetings have been made to date (10/94), twelve papers, 25 proceedings, plus over 150 responses to inquiries.

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Assessment

Prior to President Elliott's arrival in 1985, there were no institution-wide assessment efforts at Central. Upon his arrival, however, the President quickly stressed the importance of being accountable to the public for what we do, and that assessment plays a key role in accountability. For the past decade, President Elliott has continued to emphasize the importance of assessment, and has provided the administrative leadership and support, as well as the financial resources, for the university to make progress in this arena.

Assessment Coordinator

In 1986, the position of Assessment Coordinator was created. The Coordinator was charged with responsibility for developing and implementing a comprehensive assessment program in accordance with Central's Mission Statement. Other duties of the Coordinator include administering the assessment budget, serving as a liaison between the administration and the Faculty Senate Assessment Committee, assisting the Director of Institutional Research by providing assessment data for institutional reports, and preparing an annual assessment report. Dr. Jim Sylwester, Professor of History, was hired as Central's first Assessment Coordinator. Dr. Mike Grelle, Professor of Psychology, was hired as Central's second Assessment Coordinator in August of 1993.

Assessment Efforts

Although there were no university-wide coordinated assessment efforts prior to the creation and implementation of Central's Continuous Process Improvement model (see page 46A), various assessment efforts have been made at the college and department levels throughout the past decade.

1985-86

- Senior-level teacher education students majoring in the arts and sciences participated in the National Teacher Examinations. The College of Arts & Sciences recommended that a system of proficiency testing be adopted institutionally.

- The College of Business & Economics developed an advisory council, to be implemented during the 1986-87 academic year. The council was composed of top executives from major companies who were employers or potential employers of university graduates.

1986-87

- Faculty evaluation was implemented in every department during 1986-87, and instruments were created for the evaluation of faculty members and department chairs.

- Assessment was a primary focus of the College of Applied Sciences & Technology in 1986, and although some departments like the Department of Nursing already had extensive assessment processes in place, very few such programs existed on a national level in the technology disciplines. Therefore, work was begun to develop assessment techniques for other technology programs from within.

- Important progress was made by the College of Arts & Sciences in the areas of writing and mathematics assessment, including proposals to implement a Writing Across the Curriculum program.

- The College of Business & Economics gave substantial effort to the establishment of its advisory board. The College also developed an assessment plan for business & economics majors to be implemented in the fall of 1987.

1987-88

- Continued progress was made in mathematics and writing assessment.

- The Department of English demonstrated leadership in writing assessment by hosting a conference at which all the Missouri universities developed plans to collaborate in writing assessment efforts.

- The Department of Agriculture held a cooperative conference for all agriculture programs in Missouri, the purpose of which was to consider cooperation for the development of joint assessment instruments.

- The College of Business & Economics developed an overall plan for assessment within the college, and utilized a number of assessment instruments during the year. The college also demonstrated leadership in the area of teaching assessment through selective use of the Kansas State IDEA System, a tool used for collecting student opinions on the effectiveness of teaching.

- The College of Education & Human Services was involved in assessment through the administration of the National Teachers Examination and the College-Base examination.

- Thirteen departments throughout the university participated in assessment of their majors by working with the Educational Testing Service in an experimental program.

- Under the direction of a new Dean of Library Services, a major self-study of Educational Media Services was completed. The resulting recommendation was that EMS become a part of the library.

1988-89

- The departments of music and theatre developed sophisticated assessment processes.
- The College of Business & Economics created an Assessment Committee, and the college's assessment requirements and strategies were evaluated in depth.

1989-90

- A five-year review of assessment activities at Central highlighted current efforts: use of student scores on national standardized tests and professional licensing exams for placement purposes; assessment tests given during the course of student programs; use of alumni surveys, employer surveys, and student and faculty satisfaction inventories.

1990-91

- The IDEA System was broadly implemented by the College of Business & Economics, and in areas of the College of Applied Sciences & Technology.

- Four members of the Department of Curriculum & Instruction developed a "teacherness" assessment instrument, in cooperation with Selection Research, Inc., and six other institutions of higher education.

- A major, 10-department effort to develop a "Continuous Process Improvement" (CPI) model for the assessment of teaching and learning began, resulting in a proposal for funding by the federal Fund for Improvement of Post-Secondary Education (FIPSE).

- Work progressed with Alverno College on a Kellogg Foundation-funded project in assessment and the improvement of learning.

- The founder of the Harvard Assessment Seminars visited Central to share information about Harvard's program.

- Faculty members attended national meetings to sharpen assessment knowledge and practices.

1991-92

- The Continuous Process Improvement model was implemented in 10 academic departments and 13 individual programs across the university.

- Assessment was added as a seventh standing faculty governance committee in the College of Education & Human Services.

1992-93

- Expansion of CPI model and project

- Library Services established an assessment process to determine effectiveness of services, client and employee satisfaction, and to target areas for improvement.

1993-94

- The Department of Agriculture established an assessment plan for all bachelor's degree programs, and refined lists of competencies.

- The College of Arts & Sciences refined departmental assessment plans.

- The College of Business & Economics made progress in several areas of assessment: CPI was used as the basis for program design, assessment and continuous improvement; the College also focused on measurement of program and student performance relative to program and student outcomes; curriculum and courses were revised to reflect feedback from program and student performance measurements and from consultation with external constituents; in addition, graduates' success was assessed through contact with alumni and employers.

- The College of Education & Human Services addressed assessment in departments and in several centers.

- Graduate Studies & Research established assessment and multicultural teaching criteria for annual graduate program review.

Continuous Process Improvement (CPI) Model & Project

During the 1987-88 school year, a core group of faculty members at Central began working toward the development of an institutional assessment plan. The group sought answers regarding WHAT should be assessed, WHY it should be assessed, and finally, a means or model that would facilitate such assessment. Faculty members determined that the WHAT should be student learning, and the WHY was because student learning is primarily valued. The group continued to search for a model and, in June of 1988, discovered Alverno College's assessment-as-learning model. In 1990, the group realized the congruence of that model with total quality management principles.

In September 1991, Central was awarded a three-year grant in the amount of $238,927 from the Fund for the Improvement of PostSecondary Education (FIPSE). The FIPSE project called for Central to (1) explicitly define a process model from the two sets of principles, (2) specify and secure faculty acceptance of a clear set of goals, and (3) develop a set of step-by-step process components to enable faculty to incrementally achieve the goals. Central committed to FIPSE to design, introduce, and implement the Continuous Process Improvement (CPI) model in 10 academic departments and 13 major programs in the first year. Such implementation occurred in the first year of the grant, 1991-92. By 1994-95, 17 departments and 26 major programs were directly involved in implementation of the CPI model.

Presently, members of the Central community are working to fully implement and integrate CPI into the university culture. President Elliott has shown continuous support for the model, and acknowledges CPI as Central's unique learning system in communications with faculty, parents, students, alumni, and the public. The academic deans have committed to complete implementation of the CPI model in all 34 academic departments by May 1998. In addition, Central's Board of Regents approved the transfer of $250,000 from the university's quasi-endowment fund to stimulate CPI development in 1995-96. A table on the following page outlines the implementation plan for Central's CPI model.

TQM/TQE

In addition to initiatives encompassed by the CPI model and project, there have been numerous other efforts made at Central in the movement toward a total quality environment. In non-academic areas, the use of cross-functional teams is increasing. Cross-functional teams are teams which are comprised of members from all facets of the campus - faculty, staff, students, administrators - and function specifically to examine, improve and/or refine current processes and procedures at the institution. Examples of cross-functional teams now in existence include the Quality Self-Assessment Team, the Enrollment Management Team, and the Start-Up Committee. The use of advisory boards and committees is also increasing. The Fee Payment Advisory Committee, the Commencement Committee, and the Traffic and Parking Policy Committee are all examples of advisory boards/committees which are currently utilized in non-academic areas at the university.

In Fall 1994, Craig Christie was employed by the university to serve as a total quality consultant. Christie brought extensive experience from the business sector regarding how to transform the institutional culture and environment into one of total quality. Christie's expertise was shared during workshop sessions with staff members in the Library, and with faculty and staff members in the College of Business & Economics. Christie also addressed numerous courses in the College of Business and Economics regarding total quality concepts and principles. He was retained by the university through spring of 1995.

In the spring of 1995, Central's Quality Self-Assessment Team (QSAT) recommended that the campus pursue a self-assessment of current quality initiatives. The QSAT also recommended that the self-assessment be based on the criteria defined by the Malcolm Baldridge National Quality Award and the Missouri Quality Award programs for the Education Category: Leadership; Information and Analysis; Strategic and Operational Planning; Human Resource Development and Management; Educational and Business Process Management; School Performance Results; and Student Focus and Student and Stakeholder Satisfaction. The quality self-assessment process was initiated on campus in the summer of 1995 and will be completed by spring 1996. Based on the findings of the QSAT, Central may apply for a Missouri Quality Award.

Assessment Philosophy

Central Missouri State University adopted an assessment philosophy in spring of 1992. The philosophy states that,

> Assessment is an integral part of the continuous process of learning and development with the purpose of enhancing a student's total university experience. Assessment uses well-defined outcomes and criteria and multiple measures. The information derived from assessment activities will be used to facilitate student learning and development, to promote faculty and staff growth and to improve the quality of academic and nonacademic programs, services and facilities.

Academic Assessment Paradigm

The following Academic Assessment Paradigm was also adopted by the university in spring of 1992.

> Academic assessment at Central Missouri State University depends upon faculty and student involvement and occurs in the form of designing, monitoring, administering and evaluating assessment activities within departments, University Studies and interdepartmental programs. Academic assessment at Central Missouri State University:
>
> - is directly related to teaching
> - is directly related to learning
> - provides information for program improvement
> - is to be used in a positive manner

Student Services Assessment Paradigm

Central's Student Services Paradigm states that Student Services Assessment at Central Missouri State University:

- contributes directly to student learning and development
- relates directly to providing support services for students and constituents
- uses multiple means to gather information for program improvement
- recognizes that students often are experiencing rapid personal growth
- recognizes that "adult learners" are an important segment of the university population
- involves the interaction of staff and students outside of the traditional classroom
- fosters personal growth in independence and leadership
- perceives that human diversity is a strength

Central's Student Services Assessment Paradigm was adopted in fall 1993.

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Report on Phases I and II of the Assessment as Learning Project

Sage Publications, Inc.

Managerial Skills

9 *A Study of the Assessment Center Method of Teaching Basic Management Skills*

Ralph F. Mullin

Paul L. Shaffer

Michael J. Grelle

Phase I: A Pretest-Posttest of Assessment Center Impact

Thirty years ago, Gordon and Howell (1959, pp. 44, 81, 104-105) identified four basic sets of skills purported to make up business competence. They found these skills, necessary for success in business, were clearly not being developed by business schools.

> Neither their published statements, their educational programs, nor our conversations with deans and faculties in all parts of the country revealed a clear awareness of what these skills are or how they may best be developed (p. 45).

In 1983 Cameron and Whetten (1983) reviewed a decade of criticism of business school curricula and concluded that management skills were

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AUTHORS' NOTES: Ralph F. Mullin and Paul L. Shaffer wrote Phase I of this chapter; Michael J. Grelle joined them in the writing of Phase II.

We gratefully acknowledge support for this research from Central Missouri State University, which funded the project ($75,000) to provide a research grounded basis for development of a model of learning and assessment that will focus on explicit performance-based student outcomes.

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still not being taught—at best, students are taught about management (content knowledge) rather than how to manage. The American Assembly of Collegiate Schools of Business (AACSB) Outcome Measurement Project Report explicitly recognizes that basic management skills are "seldom systematically addressed by curricula" (1987, p. 2). Porter and McKibbin's (1988, pp. 71-72) findings continue to confirm the rather large gap between the current reality and what "should" be in terms of behavioral emphasis in business school curricula. The "Big 8" accounting firms' *Perspectives on Education* (Accounting Education Change Commission,1989) states:

> There must be a focus on the broader skills. . . . Without a clear set of capabilities to use as objectives in the curriculum design process, it is unlikely that changes in the current content or teaching methods will be responsive to the needs of the profession. . . . Basing pre-entry education (university) on capabilities will mean fundamental changes in the curriculum. (p. 5)

In spite of the evidence that basic management skills are not being systematically integrated into B-school curricula, they are frequently a topic at professional conferences.

What are these basic management skills? The AACSB Outcome Measurement Project (1987) identifies and defines both academic subject knowledge (seven content areas) and skills and personal characteristics (SAPCs). Development Dimensions International (DDI), in the skills diagnostic program (SDP) designed for AACSB, elaborates nine dimensions of management skills and personal characteristics (SAPCs). Importantly, DDI has developed operational definitions and a set of assessment center type exercises and evaluation procedures to measure these skills. While there are numerous taxonomies of the basic skills essential to successful practice, the degree of commonality is indeed striking. Table 9.1 displays the similarities of a few of these.

How can these skills best be developed? Cameron and Whetten (1983) emphasize that achieving change in student management skill behaviors requires a different type of learning than does the acquisition of content knowledge. The chief executive officers of the "Big 8," in *Perspectives on Education*, suggest new methods are demanded.

> The current textbook-based, rule-intensive, lecture/problem style should not survive as the primary means of presentation. New methods, both those used in other disciplines and those that are totally new to university education, must be explored. (1989, p. 11)

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Table 9.1
Taxonomies of Basic Management Skills

1959 Gordon & Howell	1988 Porter & McKibbin	1988 Development Dimensions Inc.	1984 Cameron & Whetten	1989 Big Eight Accounting Firms	1989 Albanese
PROBLEM-SOLVING	ANALYTICAL	ANALYSIS	CREATIVE PROBLEM-SOLVING	INTELLECTUAL Problem-solving Creative	Decision-making
Decision-making Analysis Judgment	DECISION MAKING RISK TAKING	JUDGMENT	GROUP DECISION-MAKING	Unstructured Problem anticipation Inductive thought	Creative Problem Solving Developing
			SELF AWARENESS Ethical issues	Judgment Value-based reasoning	Self-Awareness
ORGANIZATIONAL Information flow Division of labor Plan, Delegate Coordinate	PLANNING/ ORGANIZING	PLANNING & ORGANIZING DELEGATION CONTROL	IMPROVING EMPLOYEE PERFORMRANCE DELEGATION & JOINT D-M	Organization of work to meet priorities	Goal setting & planning Organizing Delegating Controlling Conducting Group Meetings Managing Time

INTERPERSONAL RELATIONS Strong personal motivation*	LEADERSHIP/ Interpersonal Initiative*	LEADERSHIP Individual Group Disposition to lead*	MANAGING CONFLICT MANAGING PERSONAL STRESS GAINING POWER & INFLUENCE	INTERPERSONAL Influence Delegation Motivation Conflict resolution	Leading Acquiring Power & Influence Managing Conflict Motivating Employee Performance Managing Group Processes Developing Subordinates Appraising Employee Performance
COMMUNICATION Oral & nonverbal Verbal, numerical Idea formulation Generating/transmitting/receiving/interpreting nonquantitative & quantitative information & data	COMMUNICATION Oral Written COMPUTER SKILLS	COMMUNICATION Oral: Communication Presentation Written	ESTABLISHING SUPPORTIVE COMMUNICATION	COMMUNICATION Presentation formal/informal oral/written Listening Obtain & organize information	Communicating: Oral Communicating: Written Active listening

*Attitude that contributes indirectly to skills

[BIGELOW TABLE 9.1 — page 1 of 2-page BROADSIDE]

[BIGELOW TABLE 9.1 — page 2 of 2-page BROADSIDE]

Gordon and Howell (1959) suggest three emphases in teaching business courses—descriptive, analytical, and managerial-clinical. They repeatedly stress "managerial-clinical teaching" as particularly well suited for teaching managerial skills (pp. 109, 135, 136, 360). Porter & McKibbin repeat the emphasis on the "clinical approach" (1988, p. 342). The assessment center method is one operationalization of the clinical method, as it entails one-on-one expert observation of the learner's practice performance with developmental feedback and repeated performance for improvement. Alverno College's application of the assessment center method to student learning, called assessment-as-learning, is based on the principle that students will learn developmentally by continuous assessment of performance plus feedback (Marchese, 1987). This performance-based learning process is explained by Bandura's social learning theory (1977). Table 9.2 extends Cameron and Whetten's (1983) model to more completely operationalize Bandura's theory.

A number of business schools have experimented with teaching management skills. These include Alverno College, Boise State University, Brigham Young University, The University of Illinois, University of Pittsburgh, Utah State University, and Detroit University. This study is, therefore, viewed as an extension of this earlier work and as a pilot study preliminarily testing the effectiveness of the assessment center method for student learning of the set of management skills identified by AACSB and operationalized by DDI. Ed Pavur of DDI (1988) comments on the uniqueness of the study: "While SDP assessments have been conducted in schools across the country since 1983, your use of the program is unique. No other application has the set of characteristics which you are employing."

Methodology

The general hypothesis is: Students who participate in the experimental course will demonstrate significantly higher levels of competency on a set of basic management skills as measured by equivalent DDI pre- and postassessment exercises.

Sample

Thirty-five junior, senior, and graduate business students registered in a course titled Business Administration Practicum, offered as an elective in the fall of 1988. Although subjects self-selected into the sample, an

evaluation and scoring. Data on the reliability and validity of these exercises are reported in AACSB (1987). The posttest (O2) measured the 35 students on eight of the original nine dimensions, using DDI parallel exercises. The posttest instruments and external scoring were also provided by DDI.

> The post-training simulations can be considered parallel to the pre-training simulations because of overlap in the key behaviors and dimensions which the simulations elicit. Specifically, 92% of the key behaviors and 100% of the dimensions are targeted for observation in both of the in-basket simulations; 100% of the key behaviors and 100% of the dimensions are targeted for observation in both of the interview simulations. . . . the two sets of exercises represent parallel versions and should meet your needs for equivalent materials. (Pavur, 1988)

In addition to the DDI skill performance measures, two questionnaires were administered to the 35 students—at the first and last sessions of the course. These covered demographics on school grade level (GLVL) and grades (GPA), parental occupation (POCC) and education (PED), work experiences (EXP), plus students' self-report perceptions of course importance (CIMP), course relevance (CREL), commitment to study (COMS), and level of performance (PERF) for each of the skill dimensions (beginning and ending).

The Learning Intervention

The learning intervention (X) consisted of: individualized conferences for feedback of pretest results and initial goal planning; ten 3-hour learning modules emphasizing team and individual experiences in practicing and assessing management skill exercises; and evolution of each student's goals and development plan. Table 9.5 outlines the course content and schedule. Resources were provided by the university and the participating telecommunications firm.

Methods of Analysis

To test the general hypothesis, both MANOVA and *t*-tests were performed to determine if there was a significant difference between pretest and posttest scores on measures of the eight dimensions. The MANOVA analysis of the pre- and posttreatment results was approached as a 2×8 within-subjects design.

Table 9.4
Measures: DDI Set of Assessment Instruments

1. *In*-Basket Exercise
   Role: Middle-level manager, manufacturing
   Task: Managing a budget, directing subordinates, and carrying out project planning, managing labor, public & government relations
   Presentation: Response in writing to the in-basket items
   Dimensions: Planning & organizing, Judgment, Problem analysis, Delegation, Control, Written communication
   Time: 3 hours, 15 minutes

2. Analysis/Oral Presentation Exercise
   Role: manager
   Task: Make recommendations to senior management re. expansion of production capacity, financing, product mix
   Presentation: Written report & brief oral presentation—videotaped
   Dimensions: Judgment, Problem analysis, Oral presentation, Written communication
   Time: 3 hours, 15 minutes

3. Planning Exercise
   Role: Manager, company finance division
   Task: Plan start-up of a word-processing unit
   Presentation: Written planning document
   Dimensions Assessed: Planning and organizing, Written communication
   Time: 2 hours

4. Group Discussion Exercise
   Role: Middle-level manager, large organization
   Task: Represent department and candidate for share of $8,000 salary increase funds (discretionary)
   Objective: Secure maximum share for candidate and complete group task quickly and fairly
   Presentation: Group discussion and data videotaped.
   Dimensions: Oral communication, Group leadership, Oral presentation
   Time: 2 hours

5. Interview Simulation
   Role: Manager, Thrift Program Management section of a large bank
   Task: Business development and administration of thrift savings programs which corporations offer to employees as part of a benefits package
   Objective: Meet with employee whose performance has slumped recently and help him/her solve problems and improve performance
   Presentation: Videotaped interaction with trained role player
   Dimensions: Control, Oral communication, Individual leadership
   Time: 1 hour

6. Self-Report Inventories
   Instrument: Two self-report inventories
   Dimension: Disposition to lead
   Time: Administration is untimed, but should require no more than 1 hour and 30 minutes

evaluation and scoring. Data on the reliability and validity of these exercises are reported in AACSB (1987). The posttest (O2) measured the 35 students on eight of the original nine dimensions, using DDI parallel exercises. The posttest instruments and external scoring were also provided by DDI.

> The post-training simulations can be considered parallel to the pre-training simulations because of overlap in the key behaviors and dimensions which the simulations elicit. Specifically, 92% of the key behaviors and 100% of the dimensions are targeted for observation in both of the in-basket simulations; 100% of the key behaviors and 100% of the dimensions are targeted for observation in both of the interview simulations. . . . the two sets of exercises represent parallel versions and should meet your needs for equivalent materials. (Pavur, 1988)

In addition to the DDI skill performance measures, two questionnaires were administered to the 35 students—at the first and last sessions of the course. These covered demographics on school grade level (GLVL) and grades (GPA), parental occupation (POCC) and education (PED), work experiences (EXP), plus students' self-report perceptions of course importance (CIMP), course relevance (CREL), commitment to study (COMS), and level of performance (PERF) for each of the skill dimensions (beginning and ending).

The Learning Intervention

The learning intervention (X) consisted of: individualized conferences for feedback of pretest results and initial goal planning; ten 3-hour learning modules emphasizing team and individual experiences in practicing and assessing management skill exercises; and evolution of each student's goals and development plan. Table 9.5 outlines the course content and schedule. Resources were provided by the university and the participating telecommunications firm.

Methods of Analysis

To test the general hypothesis, both MANOVA and *t*-tests were performed to determine if there was a significant difference between pretest and posttest scores on measures of the eight dimensions. The MANOVA analysis of the pre- and posttreatment results was approached as a 2×8 within-subjects design.

Table 9.4
Measures: DDI Set of Assessment Instruments

1. In-Basket Exercise
   Role: Middle-level manager, manufacturing
   Task: Managing a budget, directing subordinates, and carrying out project planning, managing labor, public & government relations
   Presentation: Response in writing to the in-basket items
   Dimensions: Planning & organizing, Judgment, Problem analysis, Delegation, Control, Written communication
   Time: 3 hours, 15 minutes

2. Analysis/Oral Presentation Exercise
   Role: manager
   Task: Make recommendations to senior management re. expansion of production capacity, financing, product mix
   Presentation: Written report & brief oral presentation—videotaped
   Dimensions: Judgment, Problem analysis, Oral presentation, Written communication
   Time: 3 hours, 15 minutes

3. Planning Exercise
   Role: Manager, company finance division
   Task: Plan start-up of a word-processing unit
   Presentation: Written planning document
   Dimensions Assessed: Planning and organizing, Written communication
   Time: 2 hours

4. Group Discussion Exercise
   Role: Middle-level manager, large organization
   Task: Represent department and candidate for share of $8,000 salary increase funds (discretionary)
   Objective: Secure maximum share for candidate and complete group task quickly and fairly
   Presentation: Group discussion and data videotaped.
   Dimensions: Oral communication, Group leadership, Oral presentation
   Time: 2 hours

5. Interview Simulation
   Role: Manager, Thrift Program Management section of a large bank
   Task: Business development and administration of thrift savings programs which corporations offer to employees as part of a benefits package
   Objective: Meet with employee whose performance has slumped recently and help him/her solve problems and improve performance
   Presentation: Videotaped interaction with trained role player
   Dimensions: Control, Oral communication, Individual leadership
   Time: 1 hour

6. Self-Report Inventories
   Instrument: Two self-report inventories
   Dimension: Disposition to lead
   Time: Administration is untimed, but should require no more than 1 hour and 30 minutes

Table 9.5
Managerial Skills Assessment and Development: Course Format and Schedule

Module # Date*	*Activity & Method*	*Dimension/Exercise*	*Assignment*
1. 8/24- 9/3	PRETEST 13 hours of assessment exercises	All six DDD Exercises Eleven Dimensions	None
2. 10/3 10/4	Feedback DDI Results Team Assignments Assess Performance Assess Improving Perf	All All Interview: 3 L,OC,C Interview: " "	Self-assess Interview Ex Video tape
3. 10/10 10/11	Discuss Course Plan Rate 2 training Videos Improving Work Habits Delegating Resp. Group Discussion	FB on Dimensions Interview Delegating " "	Work pp 193-202 Module III Phase I
4. 10/17	Leadership Concepts Values Clarification Goal-setting/Planning	Self-analysis Quest Values Exercise Goal-setting Ex.	Do Module 1 parts 1-4 Meet w Mullin
5. 10/24 10/35	Goal-setting Time Management Decision-making	Finish Goals Draft 7 Day Time Analysis Exercise, p 263	Mod. I Part 4 Mod. I Part 6 Mod III Part 5
6. 10/31 11.1	Review Interview Ex. Interview Exercise Team Evaluation of Ex.	Leadership/Control /Oral communication	Review Interview Exercise Guide
7. 11/7 11/8	Complete In-basket Exercise (Woodlands)	In-basket, 6 Dmns 3 hour exercise	Review of In- basket Guide
8. 11/14 11/15	Assess In-basket Ex. Terry Butler (Union 152-4)	Planning/organizaing Judgment, analysis Control, Delegation	Self-assess DDI In-basket
9. 11/21 11/22	Assess In-basket Exer. (Union 152-154	Laura Marquart, UTS Malloy Gould, CMSU	Complete UTS In-basket Ex.
10. 11/28 11/29	POST-TEST DDI Interview Exercise	Three Dimensions	Review videos
11. 12/5 12/6	DDI In-basket Exercise (Union 152-154)	Six Dimensions	Review: 3 In- baskets + notes
12. 12/9 F 4-6PM	Focus Groups	Course Evaluation Term Paper due	Review notes Complete Goals

* Three-hour class except for the 13 hours of pretesting

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Table 9.6
Test of General Hypothesis

Learning Effects (Difference)

MANOVA (2 × 8)	Canonical Cor	*p* value
Pre-Post Difference	.97	0.000
Interaction: Pre-Post (2) with Dimensions (8)	.82	0.001

t tests: Difference (Posttest—Pretest) on Individual Dimensions

Dimension	*t* value	*p* value
1. Leadership	1.43	0.16
2. Oral Comm	-0.48	0.63
3. Written Comm	-0.30	0.77
4. Planning & Org	0.91	0.37
5. Analysis	1.77	0.08
6. Judgment	3.33	0.002 *
7. Delegation	6.35	0.000 *
8. Control	-0.15	0.88

NOTE: In addition to tests of the general hypothesis, several analyses were performed to identify independent variables that predicted performance for pretest (PRET), posttest (POST), and gain (GAIN) scores. A series of regression analyses (including stepwise) were used to determine the significance and magnitude of these effects. Considering the small sample size, a priori statistical significance was set at a *p* value of 0.05.

Results

The general hypothesis was supported. Both a *t*-test on total gain scores for all eight dimensions ($p = .0001$) and the MANOVA 2 × 8 (Canonical Correlation = 0.968, $p = .0001$) provide statistically significant evidence that learning from the pretest and treatment was effective in increasing overall student performance on the target set of basic skills as measured by the pretest-posttest difference (GAIN).

It was not hypothesized that the students would show statistically significant ($p = 0.05$ or less) gain scores on the eight individual skill dimensions; however, gains in two of the eight dimensions—judgment and delegation—were significant. Additionally, the analysis dimension approached significance (Table 9.6).

Discussion

The results provide evidence that students can learn basic management skills in an academic setting using an assessment center method that combines skill practice with assessment and feedback. The one-group pre-post research design, though commonly used in educational research, is weak from a research perspective. This design has several obvious inadequacies, for example, measurement, maturation, history, and regression effects. The most serious of these, in terms of affecting dependent variables, is measurement effect. In this case, the pretest measure is highly reactive—13 hours of assessment exercises. Used in this manner the pretest is an important and integral part of the learning treatment itself. Measurement of the independent learning effects of the pretest and intervention will require a stronger research design.

Adoption of the assessment center method for management skill assessment and development by business schools will require convincing evidence that the assessment center method and specific operationalizations produce significantly greater learning outcomes than traditional methods. Thus, a study using a stronger research design and longitudinal tests should be conducted.

A more difficult question for research is whether these skills are learned more effectively within specially designed courses focused on these skills or by systematic integration of skill learning and practice across the curriculum. For example, testing the comparative effectiveness of the University of Illinois program, where basic skills are taught in a dedicated Principles of Management course, and Alverno College's program, where skill assessment and learning are integrated throughout the curriculum.

Conclusion

The literature suggests that the need for business schools to teach basic management skills has been evident for 30 years. Business schools as a group have, consciously or unconsciously, failed to make a well-defined response. Results of the preliminary study support the proposition that basic management skills, as defined, can be learned in an academic setting, using the assessment center method. The assessment center method may provide business school faculty and administrators a credible means for response. Further study, however, is needed to determine the differential effects of alternative methods.

Phase II: A Solomon Four Design Test of Methods

This section extends the study described previously, which provided evidence that students can learn a well-defined set of basic management skills in a traditional undergraduate academic setting, using the assessment center method that combines skill practice with assessment and feedback. The preliminary study's limited one-group pre-post research design, however, provided no evidence as to the comparative effectiveness of this method.

Since adoption of the assessment center method for management skill learning by business schools will require more convincing evidence, one purpose of this Part 2 study was to test the effectiveness of the assessment center method against a more traditional textbook/lecture-intensive method, using a stronger research design. Additional research questions included: Can learning of basic management skills be achieved without a commensurate loss of content knowledge learning? Will faculty using the assessment center method receive lower student course evaluations? Can basic management skills be adequately learned within a single course (e.g., Whetten [19XX], University of Illinois), or does skill acquisition require student learning and assessment developmentally across the curriculum (e.g., Alverno College's ability-based learning program)? The following hypotheses were developed to test all but the last question:

H1: Students who participate in experimental, assessment-center method classes (X1) will demonstrate higher levels of competence on a target set of basic management skills, measured by equivalent DDI preassessments (O1) and postassessments (O2), than students in traditional classes (X2);

H2: Students who take the DDI skills preassessment (O1) will perform higher on the parallel postassessments (O2) than students not given the extensive preassessment exercises (O2 only);

H3: Despite experimental classes (X1) devoting up to 40% less class time to content knowledge acquisition than traditional classes (X2), no statistically significant difference is expected between classes on content knowledge acquisition as measured by four objective tests;

H4: No significant difference is expected in instructor ratings, as measured by the Educational Testing Service's (ETS) Student Instructional Rating (SIR), regardless of the method used (X1 or X2).

The Literature

Gordon and Howell (1959) identified the need for business schools to develop in students a set of basic managerial skills. Thirty years of study and applied experimentation have provided considerable knowledge about what these abilities are (definitions and taxonomies) and about how to facilitate student learning of them (AACSB, 1987; Cameron & Whetten, 1983; Mintzberg, 1973; Porter & McKibben, 1988). In summary, the literature suggests:

1. Although different labels are used, for example, basic management skills, competencies, capabilities, skills and personal characteristics (SAPCs), or abilities, they appear to be describing the same or quite similar basic construct namely, what the students can actually do as a result of learning (AACSB, 1987; Accounting Education Change Commission, 1989; Boyatzis, 1982; Gordon & Howell, 1959).
2. Similarly, much commonality exists between the variety of definitions and taxonomies that have been developed (Table 9.1).
3. A variety of experiential methods have demonstrated effectiveness as means of facilitating student learning of these abilities in academic settings (Bigelow, 1988; Cameron & Whetten, 1983; Henderson, 1981; McEvoy, 1989; see also Chapters 5 and 11 of this volume).
4. Management faculty generally believe competency-based management education (CBME) is possible and desirable, further definition of competencies should be achieved, and the philosophical arguments used to oppose CBME are logically inadequate and unsupported by theory and research (Albanese, 1989).
5. The management skills development movement is stalled (Whetten, Windes, May, & Bookstaver, Chapter 2 of this volume). Continued faculty resistance on philosophical, methodological, logistical, personal interests, and negative sanctions, both institutional and professional, may explain this lack of progress.

Methodology

Random assignment of students to sections of the Principles of Management course proved not to be feasible; thus, students were allowed to enroll freely in any of eight sections paired by time period (to control for class time period differences). To establish comparability of groups,

simple (one-way) analyses of variance tests were performed on the grade point averages of the students from the eight sections of Principles of Management (MGT 3310). No significant differences were found ($F = 1.65, p > .10$), suggesting that the groups were equivalent prior to the start of the experiment.

Research Design

The design was a special type of 2×2 factorial, called a Solomon Four Group. The factors were Pretest (Yes/No), and Instruction (Experimental/Traditional). The design was chosen because it allows for the measurement of Pretest effects alone, Instruction effects with and without the effects of Pretest, and the assessment of the interaction between Pretest and Instruction.

To control for differences attributable to teaching effectiveness, two instructors were chosen by the researchers and the department chair on the basis of equivalent experience, comparable student ratings, qualifications, sex, and age. Each instructor was assigned to four equivalent sections of MGT 3310, representing each of the four design conditions.

Measures

Measures included (a) parallel assessment exercises (pretest-posttest measures), (b) four traditional objective tests of content knowledge, and (c) student course evaluations.

1. Assessment Exercises

The pre- and postassessments of student management skills were equivalent sets of three assessment exercises developed by Development Dimensions International (DDI) to operationalize 14 skills and personal characteristics (SAPCs) defined by the Skills Diagnostic Program (SDP) of the Outcome Measurement Project (AACSB, 1987). Table 9.7 describes the assessment exercises and the skill dimensions measured. DDI provided expert evaluation and scoring. Data on the reliability and validity of the pretest exercises are reported in AACSB (1987). The parallel postassessment exercises were newly developed by DDI specifically for this project, and no reliability or validity data were available at the time of the study.

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(complex), interaction, in-basket (writing), job selection interview, and small group decision making. The assessment-center-type exercises that were used involved students both in role play and in vicarious learning via assessment of teammates, using criteria specific assessment forms (Table 9.9). These were scheduled to approximately coincide with content knowledge coverage in the text. Thus, while traditional sections learned about a management principle or skill, the experimental sections learned both the principles and the applications.

Traditional

The traditional learning intervention (X2) covered the same textbook chapters and assignments and depended exclusively on the lecture-intensive method of teaching content knowledge. Both instructors were guided by how they had taught the course previously.

Methods of Analysis

To test hypotheses 1 (H1) and 2 (H2), a MANOVA analysis was performed on the pre- and posttreatment results ($2 \times 2 \times 14$ mixed design). The two between-subjects factors were Treatment (Experimental vs. Traditional) and Experience (Post- Only vs. Pre- and Post-). To test hypothesis 3 (H3), ANOVAs were used to compare the difference in means between the experimental groups (X1 and X2) and the traditional groups (X3 and X4) on student scores on the four content knowledge tests. ANOVA was also used to test hypothesis 4 (H4) to determine if any significant differences existed between experimental and traditional treatments on student course evaluations.

Results

Hypothesis 1 (H1) was supported. The MANOVA indicated a significant ($p < 0.001$) learning effect due to the experimental treatment (Table 9.10). This provided statistically significant evidence that the experimental treatment, as compared to the traditional treatment, was effective in increasing overall student performance on the target set of basic management skills as measured by the pretest-posttest difference on DDI's measures.

Hypothesis 2 (H2), which predicted that students taking the skills preassessment would score higher on the postassessment, was not supported. The MANOVA showed no significant difference ($p = 0.534$)

Table 9.9
Description of Skills Learning Exercises

1. Values/Goal Setting
   Role: Self in career context
   Task: Clarification of personal values and goal-setting re abilities
   Skill Dimensions: Judgment, Problem analysis, Impact (motivation)
   Time: 3 class periods (50 min.) and 3 hours out of class

2. In-Basket Exercise
   Role: Manager, district government office
   Task: Evaluating and directing subordinates, project planning, etc.
   Skill Dimensions: Planning and organizing, Judgment, Problem analysis, Delegation, Control, Written communication
   Time: 3 class periods (50 min.) and 3 hours out of class

3. Interview and Analysis
   Role: HRD trainer, new employee, worker/mentor, or department
   Task: Interview and analyze new employee orientation program
   Presentation: Written report of analysis and recommendations
   Skill Dimensions: Judgment, Analysis, Oral and Written communication
   Time: 3 class periods (50 min.) and 1 1/2 hours out of class

4. In-Basket Exercise
   Role: Middle-level manager, sales
   Task: Directing subordinates, dealing with customers and suppliers
   Presentation: Response in writing to the in-basket items
   Skill Dimensions: Judgment, Problem analysis, Written communication
   Time: 2 class periods (50 min.) and 1 hour out of class

5. Selection Interview
   Role: Personnel department, recruiter
   Task: Preparation and conduct of three selection interviews
   Skill Dimensions: Oral communication, analysis
   Time: 3 class periods (50 min.) and 1 1/2 hours out of class

6. Small Group Decision-Making
   Role: Sales manager (5 different roles, e.g., backgrounds)
   Task: Development of decision criteria and alternative solutions by group consensus (highly diverse member characteristics)
   Assessment: Day 1-Group role play, Day 2-Observe group, Day 3-Discuss Skill Dimensions: Oral communication, Analysis, Group leadership
   Time: 3 class periods (50 min.)

between the preassessment and postassessment sections and the postassessment-only sections (Table 9.9).

Table 9.10
Tests of Hypotheses H1 and H2: SSPSX MANOVA 2 × 2 × 14 Mixed Design

Source of Variation	*SS*	*DF*	*MS*	*F*	*Sig of F*
Within cells	1909.42	3484	.55		
DIMENSIONS (14)	1690.83	13	130.06	237.32	.000
TRTMT BY DIM (H1)	28.61	13	2.20	4.02	.000
EXPER BY DIM (H2)	6.53	13	.50	.92	.534
TRTMT BY EXPER BY DIM	10.15	13	.78	1.42	.140

N = 272

MANOVA 2 × 14
Treatment (Experimental vs. Traditional)
with Dependent variables (14 Skill Dimensions)

	Canonical Cor.	*p*-value
Interaction: Treatment (2) with Skill Dimensions (14)	.37	0.000

Hypothesis 3 (H3) was supported. No significant differences were found between the traditional and experimental sections on the four content knowledge exams (Table 9.11).

Hypothesis 4 (H4) was likewise supported. No significant differences ($p = 0.30$) were found between the experimental and traditional sections on student course evaluations, measured by ETS's SIR (Table 9.12).

Discussion

Support of hypothesis 1 (H1) provides additional evidence that selected basic management skills can be learned in an academic setting and that the assessment center method is an effective pedagogy for undergraduate students. This finding confirms the results of the Phase I study.

The lack of support of hypothesis 2 (H2) suggests that, without timely and developmental feedback, learning effects of pretest assessment exercises will not be significant. Considering the extent of concern given to control of pretest effects (sequence effects and interaction of testing and treatment) in research design (Campbell & Stanley, 1963), it is surprising that this highly reactive seven-and-one-half hour pretest provided no statistically significant threat to internal validity. The results are, however, perfectly consistent with and explained by social learning theory

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Table 9.11
Test of Differences on Content Knowledge Exams—H3

Design Test	*Group*	N =	*Mean*	*F* =	*p* =
One	Experimental	141	83.5		
(100 pts.)	Traditional	132	85.5	1.07	0.71
Two	Experimental	141	82.2		
(100 pts.)	Traditional	132	83.2	1.27	0.16
Three	Experimental	140	80.7		
(100 pts.)	Traditional	131	82.3	1.21	0.28
Four – Final	Experimental	139	159.3		
(200 pts.)	Traditional	131	159.3	1.22	0.24
Combined	Experimental	141	402.8		
(500 pts.)	Traditional	132	408.5	1.00	0.996

Table 9.12
Tests of Differences in Student Course Evaluations

Hypothesis: H4
SAS ANOVA

Question: How would you rate the quality of instruction in this course?

Source	SS	DF	Mean S	F Value	Pr F	R-square
Model	0.49	1	0.494	1.08	0.30	0.005
Error	100.26	219	0.458			
Total	100.75	220				

Means: 1. Traditional (n = 111) 4.405
2. Experimental (n = 110) 4.50

Interpretation: No significant differences between experimental and traditional treatments on student instructional reports

(Bandura, 1977). Since no feedback of results from the pretest was given to students, any immediate learning effects were not reinforced and, thus, not retained.

Support of hypothesis 3 (H3) suggests that faculty concern regarding the deleterious effect that teaching basic management skills might have on content knowledge acquisition is unfounded. The results were consis-

tent with the intuitive proposition that a synergy exists in student learning of content knowledge through applications that simultaneously develop relevant basic skills. Outcomes were also consistent with evidence from 20 years of experience with an ability-based learning program at Alverno College (Mentkowski & Doherty, 1984); namely, as students see the connection between content knowledge and "how they can use it out there" via skill applications, knowledge becomes more meaningful and important.

Support of hypothesis 4 (H4) suggests faculty concerns that students may react negatively to new methods, because they are different or because they place greater responsibility on the student for learning, are probably unwarranted.

Results of the current study clearly support the proposition that the assessment center method can be effective in teaching skill acquisition with no loss of content knowledge learning. However, the difference between experimental and traditional sections on posttest scores, while statistically significant, was of low magnitude (Canonical correlation = 0.37). Additionally, when differences were tested for the 16 individual skill dimensions, only 6 were statistically significant, the differences were minor, and the results were mixed. The experimental treatment thus was effective compared to the traditional treatment, but students developed in small increments and not consistently. Artificial and weak effects of experimental manipulation are common. In this case, student grades were dependent only on completing the postassessment exercise and not on the quality of their performance. This may partially explain the low magnitude of the experimental effects. Another explanation is that a single course can be expected to produce only minor gains in student skill development and then only for a limited number of management skills.

Examination of the normed data reveals that, although students compared favorably to the AACSB/DDI Skills Diagnostic Program's (SDP) norm group in Phase I of the study, when posttest scores from Phase II were compared to an external norm group of beginning and middle level managers, student skill levels were far below what employers may expect from graduates. These junior-level students may be expected to develop somewhat as they complete their program. However, since these skills are not addressed by business school programs, gains may be expected to be minimal. Obviously, if performance levels of our students are expected to measure up to those in the work force, more development is needed than can be expected in one course. The results, taken as a whole, thus strongly suggest the need for the adoption of a comprehensive abilities-based model for the entire business school curriculum.

Table 9.13
Assessment-as-Learning Model

Assumptions About Learning

Learning involves making an action out of knowledge—using knowledge to think, judge, decide, discover, interact, and create.

An educator's best means of judging how well a learner has developed expected abilities is to look at corresponding behavior—thinking behavior, writing behavior, inquiry behavior, appreciating behavior, for instance.

Learning increases developmentally, even in its serendipitous aspects, when learners have a sense of what they are setting out to learn, a statement of explicit standards they must meet, and a way of seeing what they have learned.

Essential Elements

- *Expected learning outcomes (including abilities)
- *Assessment as process involving multiple performances
- *Explicit criteria
- *Expert judgment
- *Productive feedback
- *Self-assessment

Principles of Assessment

1. Assessment is an integral part of learning.
2. Assessment must involve a sample of behavior.
3. Assessment must involve a performance of an ability representing the expected learning outcomes of a course, a program, a department, and/or the institution.
4. Assessment involves expert judgment based on explicit criteria.
5. Assessment must incorporate structured feedback.
6. Assessment must occur in multiple modes and contexts.
7. Assessment must incorporate an external dimension.
8. Assessment is cumulative.
9. Assessment instruments must incorporate open-ended possibilities for demonstrating a given ability.
10. Self-assessment is an essential part of assessment as well as a goal of the process. It is an essential ability for the autonomous lifelong learner.

SOURCE: Alverno College (1986)

Development and evaluation of a new model for curricular and pedagogical reform is the goal of the future phases of this study. Such a model will focus on the abilities-based general and program-specific student outcomes. These outcomes will be the organizing principles for redesign

of courses and methods with extensive assessment of student performance, both within courses and comprehensive. The model's assumptions about learning are taken from Alverno College's assessment as learning model (Table 9.13).

The implications for future research include application of the model and method to the entire curriculum for a major, such as Management, and then generalizing the application to a variety of majors both within a college of business and in a variety of disciplines in other colleges of a comprehensive university. The final stage should be explicit definition of the entry-level criteria for abilities. These then can become the exit criteria for a university's general education program.

Conclusions

The study suggests that renewed progress in Competency-Based Management Education (CBME) may be achieved by business schools addressing the development of basic management skills systematically across the curriculum. This is a clear challenge made in *Perspectives on Education* (Accounting Education Change Commission, 1989). The required level of faculty and administrative planning, and matrix program coordination, is not evident in most business schools today. One logical response to this challenge is for groups like AACSB, the Academy of Management, the Organizational Behavior Teaching Conference and others to devote time at their conferences and meetings to focus on the combined issues of defining capabilities that can serve as curricular design objectives, systematic curricular reform, and new teaching and assessment methods.

Acknowledgement

The enclosed article describes the results of an ongoing program of action research on assessment as learning at Central Missouri State University. This program started in fiscal year 1987-88 with a small grant from the University's assessment funds of $5,000. The program progressed as follows:

Single Course, 1988 - focus on basic management skills.
(Phase I: one group pre-post design, $10,920, n=35)
Eight Sections, 1990 - management skills and content knowledge.
(Phase II: Solomon four group design, $72,376, n=276)
Ten Courses, 1990-91 - integration of skills and knowledge.
(Phase III: 10 courses in four colleges, $9,000)
Ten Departments, 1991-94 - Application of Continuous Process Improvement model to outcomes.
(Phase IV: 13 major programs, FIPSE Project)

The principle investigators wish to especially acknowledge the contributions made by the following:

President Ed Elliott
Provosts H. Keith Stumpff (deceased) and William A. Bloodworth
University Assessment Officer: Jim Sylwester

Faculty Senate Assessment Committee members 1987-91:

Jim Smith	Don Nimmer
David DeFrain	Jim Sylwester
Dale Helmick (deceased)	Stacy Prince
Dee Hudson	David Eshelman
Susan Morgan	Mary Ragland
Gary Raines	Mike Grelle
Ralph Mullin	Walt Hicklin
Sharon Lamson	Mike Powers
Chris Swatosh	Marty Carter
Michelle Hickman	Christy Cromer

Phase II evaluation team and Phase III instructors/investigators:

Mildred Barnes	Sharon Lamson	Don Nimmer
Norm Betz	Mike Powers	Malloy Gould
Bill Downs	Mary Ragland	Jim Sylwester
Elvta Harris	Art Rosser	
Aileen Helmick	George Wilson	

Instructors for the eight Phase II sections:
Mary Beth DeConnick and Cindy Gayhart

Research and Grant Services: Jack Sigler

Central
MISSOURI STATE UNIVERSITY

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July 24, 1995

Dr. Charles J. McClain
Commissioner
Coordinating Board for Higher Education
3515 Amazonas Drive
Jefferson City, MO 65109-5717

Dear Dr. McClain:

I am pleased to submit the enclosed Funding for Results (FFR) proposal for consideration by the Coordinating Board for Higher Education. As part of our FIPSE funded Continuous Process Improvement (CPI) project, which ended this past fall, some 20 departments at Central have begun to use outcomes, assessment-as-learning techniques, measures of input, diagnostic testing, and a variety of other methods to improve curricula, pedagogy, and student learning. These efforts to generate increasingly higher quality teaching and learning are proving to be effective. Goals and criteria of FFR and many current Central teaching and learning initiatives are highly complementary and can be mutually supportive. Clearly, FFR support is needed and can be used to expand Central's CPI and other campus quality improvement efforts to more departments and academic support functions.

For the first year, FY 1996, Central's proposal is that its FFR efforts and program emphasis focus on the implementation of the recently approved University Studies program. The enclosed abstract describes in more detail the specific goals of the project and the responsibilities of our campus level FFR team. The team, chaired by Central's Coordinator of Assessment and Testing Services, is truly campus-wide with members from all four colleges, the major administrative divisions, and the student body. Attachment A lists the FFR team members and the unit or group they represent.

I strongly support this FFR initiative. Central Missouri State University has proven through its commitment of time, money, and effort, that it is serious about continuously improving student learning and development. University Studies is at the heart of all of our undergraduate programs and is the logical topic of focus for this pilot project.

Should you have any questions or desire any additional information, do not hesitate to contact Mike Grelle, chair of the FFR team, at (816)543-4919 (Fax 543-8022).

Sincerely,

Ed Elliott
President

EE:raf

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CAMPUS LEVEL FFR PROJECT

Background.

Central's University Studies (general education) Committee recommended, and the institution adopted in 1994, a revised University Studies Program. This program establishes as general education goals for all undergraduate students at Central, the four general outcomes of thinking, interacting, valuing, and communicating. According to the guidelines of the revised University Studies Program, all faculty teaching a university studies course must teach to and assess at least two of these four general outcomes.

Although the University Studies document addresses the issues of assessment and evaluation, there are no directives indicating how the program is to be implemented. Central's campus FFR team (See Attachment A for a list of team members.) therefore decided that the pilot project would focus on the implementation of the revised University Studies Program, which is set to begin in the summer of 1996. The FFR team established two major goals for the pilot project: 1) education of faculty in performance-based assessment related to thinking, communicating, interacting, and valuing, and 2) development of an entry-level comprehensive assessment of the general outcomes. Full implementation of the revised University Studies Program is a quality initiative that may require five to six years to complete.

Learning and Teaching Issues.

The primary goal of this project is to continuously improve and assess the quality of general education at Central Missouri State University. The project's theme is a direct outgrowth of Central's Mission and Goals Statement which reads in part, "In fulfilling its responsibilities, the University ... provides an undergraduate liberal arts and science foundation with an emphasis on integrating critical thinking, communication skills, and technological applications into the curriculum across all disciplines."

The addition of the four skill areas of thinking, communicating, interacting, and valuing to the University Studies Program creates a tremendous need for faculty development in performance-based assessment. Specifically, the faculty need to a) develop and integrate assessment-as-learning teaching methods and strategies into their courses, and b) more effectively use feedback from in-class assessments to improve teaching and learning.

Intervention Strategies.

Since only a little more than a year remained between the adoption of the revised university studies program and its implementation, it was imperative that the faculty training portion of Phase 1 of the project began as soon as possible. Late last fall, four faculty Outcome Teams, based on the four general outcomes, were formed. These teams are the implementation arm of the University Studies Committee. The faculty team leaders directed monthly meetings for faculty (30-35) who were interested in developing expertise in performance-based assessment. This spring, a series of workshops were scheduled and planned by the Outcome Team leaders. On June 16-17, 1995, Central held a workshop for faculty who will teach university studies courses in the fall of 1996. The workshop was led by the team leaders and over 85 faculty attended. The workshop helped faculty develop new teaching and assessment strategies and skills that address the two outcomes they submitted in their approved course proposals. Additional training workshops are scheduled for 10/20/95, 1/8-9/96, and 6/21-21/96 as well. By next fall, all faculty scheduled to teach in the revised university studies program should have received initial training in performance-based assessment.

Data Elements and Measures.

In order to have reasonably accurate estimates of the impact of the revised program on the quality of the general education of our students, the university needs to assess the competency of entering freshmen in the four outcome areas, as well as student reaction to the revised program as a whole. This fall a team of five faculty are to develop a comprehensive performance-based assessment of the four general outcomes that will be administered to the freshmen in the fall of 1996. This assessment will be used to establish a performance baseline for each student in the four outcome areas and to identify their relative strengths and weaknesses. The faculty team, along with other groups of faculty, employers, and professionals from outside the institution, will have the responsibility for developing test reliability and validity for this comprehensive assessment. Members of this external review team will also serve as evaluators of student performance. The comprehensive assessment should be ready for pilot testing in the spring of 1996 on a sample of graduating seniors. These seniors represent the last cohort to graduate from our institution under the old university studies program. These results will be used as a baseline against which students graduating in the future under the revised university studies program can be compared.

Eventually, there will be three primary assessments of the four outcomes. The first assessment will be used to establish an entry-level baseline of students and to identify areas of strength and weakness. The second will be used to determine if a student is ready to enter the major program of his/her choice. The third assessment of the four general outcomes, in which the content area of the major will provide the context for the assessments, will be administered to seniors to determine if the student has met university general education (university studies) standards for graduation. This assessment regimen will also give us entry and exit performance measures, which may be used to estimate value added, and possibly

allow us to make comparisons against benchmark institutions. Attachment A presents a timeline for these and other projected assessments, as well as a brief description of each. These assessment data will become an important part of our permanent student data base.

According to the guidelines of the revised University Studies Program, each faculty member teaching a university studies course will be asked to demonstrate how they used assessment information collected in their classes to improve their teaching. The mechanisms by which faculty will be audited to determine how they are using this feedback has not been established at this time. However, the Faculty Senate University Assessment Council has discussed using the program reviews (five or six of these occur campus wide annually) as a mechanism for such an audit. Another possible feedback mechanism is the annual report. Each academic department is currently required to submit an annual report which requests information on these same issues. The deans and provost review these reports and provide the chairs with a performance relation evaluation regarding their progress towards their stated goals. The University Studies Committee, which is also specifically charged with this responsibility, will submit a plan this coming year (1995-96) for how a systematic audit of University Studies courses could be conducted.

Reward Structure.

The University formally emphasizes excellence in teaching by requiring evidence of quality teaching as a prerequisite for all promotions. Central Missouri State University is currently considering the implementation of a common teaching evaluation instrument. One of the instruments being considered is the IDEA form. The IDEA form is a nationally-normed teacher evaluation instrument developed at Kansas State University, which can be used for both teacher evaluation (short form) or for improvement of teaching (long form). Central's teacher evaluation program collects university-wide data on the quality of teaching and assessment. These data will be used to improve course content and student skills development within University Studies and individual disciplines, and to improve the faculty teaching practices. In addition, academic departments will utilize a variety of other teaching-effectiveness assessments to measure both pedagogy and curriculum effectiveness.

The University is developing other incentives for faculty and faculty teams who provide leadership and positive changes in pedagogy and curriculum. The FFR team, along with several other campus groups, are examining plans for restructuring the current reward system to increase the focus of institutional resources on the core process of the university--student learning and development. The proposal to restructure the reward system, now in the developmental stage, will be initially implemented during the 1995-96 academic year. The envisioned reward system will provide monetary allocations to departments and units that provide evidence of improvement in student learning and teaching.

In FY 1996, the Faculty Senate University Assessment Council, the University Studies Committee, the Academic Council, and the FFR team plan to use FFR dollars received by Central to support the university's assessment plan and process. Initially, Central has set

aside approximately $30,000 from next year's university assessment budget to fund department level and/or interdisciplinary assessment efforts dealing with the implementation of the revised University Studies Program. Other incentive funds, of a significant amount, will be allocated for assessment and faculty development. Central is developing a campus-wide agreement about the criteria and processes for distributing rewards based on achieving University Studies goals for academic year 1995-96 and beyond. The commitment of these funds demonstrates Central's dedication to student learning and to this project.

Project Evaluation.

The project team, led by the University's Assessment Coordinator, will be responsible for both formative and summative evaluation of the pilot project. There is considerable campus interest in measuring the specific impact of new pedagogical techniques on student learning of the four general outcomes (comprehensive performance assessments), on student perceptions of their learning and of the institution in general, and on student evaluation of teaching. These assessments will occur at both the classroom and university level and the information may be used primarily as feedback to faculty and students for the improvement of teaching and learning (formative evaluation). These data will contribute to a permanent data base which will allow faculty and others to track changes in student performance, attitudes, and teacher evaluations over time. The results from these comprehensive assessments will also be used for evaluation of the university studies **program**, and as possible evidence of quality performance (summative evaluation).

SUMMARY.

Central Missouri State University's FFR pilot project represents the initial implementation phase of its revised University Studies program. Specifically, the pilot project will focus on 1) the preparation of faculty to teach in the new university studies program, and 2) the development of comprehensive assessment instruments that measure student competency in the four outcome areas The project, an outgrowth of the university-wide CPI effort started at Central in 1991, is designed to improve teaching and learning, and to provide evidence of quality in the area of general education.

ATTACHMENT A

CAMPUS LEVEL FFR COMMITTEE

NAME	PHONE	AREA
Grelle, Michael	4919	Coordinator of Assessment

Shaffer, Paul, ex officio	4560	Advisory Board for FFR
Mees, J. P.	4116	Provost

Hannah, Lyman	Assessment Coordinator, Applied Science & Technology
Karscig, Mark	Assessment Coordinator, Business and Economics
Mazza, Joe	Assessment Coordinator, Arts and Sciences
Mihalevich, Carol	Chair, Faculty Senate University Assessment Council and Assessment Coordinator, Education and Human Services
Carr, Kathy	Outcomes Team Leader
Sundberg, David	Faculty Senate University Assessment Council
Bennett, Marvin	Finance and Administration
Hicklin, Walt	Student Affairs
Hudson, Dee	Admissions
Nimmer, Don	Institutional Research
Schneider, Shannon	Student Representative, Strategic Planning Council
Student to be named	Student Representative, Faculty Senate University Assessment Council

ATTACHMENT B

PROPOSED ASSESSMENT STRUCTURE

Entry (Freshmen)	Midpoint (Rising Junior)	Exit (Senior)
Basic Intellectual Skills Oral Communication Writing Mathematics Reading Listening	General Outcomes Thinking Communicating Interacting Valuing	General Outcomes Thinking Communicating Interacting Valuing
General Outcomes **Thinking** **Communicating** **Interacting** **Valuing**	Program Outcomes Content and Skills Specific to Major	Program Outcomes Content and Skills Specific to Major

This table indicates the major academic assessments that will be administered to students upon full implementation of Central's University Assessment Plan. The Entry level assessment of the four General Outcomes (as indicated in bold print) will be developed as part of the Pilot Project.

FACULTY QUESTIONNAIRE

EXHIBIT 8a

PART I: Using the scale below, please rate the degree of your agreement or disagreement on each statement. Then, in the right-hand column, rate the degree of your agreement or disagreement with the statement: "My understanding of this statement has changed significantly since 1991."

---

5 Strongly Agree
4 Agree
3 Neither agree nor disagree
2 Disagree
1 Strongly disagree

Part I

	Present	Change 1991-94
1. Student learning is the primary purpose of an educational institution.		
2. Education goes beyond knowing to being able to do what one knows.		
3. Learning must be active and collaborative.		
4. Assessment is integral to learning.		
5. Abilities must be developed and assessed in multiple modes and contexts.		
6. Performance assessment–with explicit criteria, feedback and self assessment–is an effective strategy for ability-based, student-centered education.		
7. A coherent curriculum calls for faculty investment in a community of learning and judgement.		
8. The process of implementation and institutionalization of a curriculum is as important as the curriculum: the process is dynamic, iterative, and continuous.		
9. Effective education requires faculty to be responsible for the process of defining outcomes and aligning all learning activities, teaching strategies, and assessment practices with these outcomes.		
10. Responsibility for education involves assessing student outcomes, documenting inputs, and relating student performance over time to the curriculum.		
11. Even if an institution has a sound curriculum in place, it should be changed.		
12. Course grades are not adequate measures of student learning and development.		
13. Assessing student competence at graduation is not the best means of assuring quality.		
14. The course credit completion model, our prevailing paradigm, is fundamentally flawed.		
15. I am committed to do the hard work to continuously improve the learning process.		

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PART II: Please rate the degree of your personal agreement or disagreement on each statement using the scale below.

5 Strongly Agree
4 Agree
3 Neither agree nor disagree
2 Disagree
1 Strongly disagree
0 Not applicable

Part II

Between Fall 1991 and Spring 1994, faculty in my department (I) have	Dept.	Self
16. collaborated in development of a set of outcomes that define what our students should know and be able to do by graduation.		
17. viewed the process of outcomes development valuable in terms of thinking more about how students learn and what colleagues are doing.		
18. thoroughly validated outcomes with constituents (students, graduates, experts, employers, graduate schools)		
19. revised curriculum to systematically assign responsibility for student learning outcomes, by level of development, to specific courses.		
20. developed criteria that define quality of performance for each outcome.		
21. accepted responsibility for developing student competence on specific outcomes integrated into course(s).		
22. changed our/my view of how and in what ways students learn.		
23. changed teaching behaviors.		
24. introduced more structured student learning applications/experiences into course(s).		
25. increased observation, assessment, and feedback of student performances.		
26. increased development and use of assessment forms.		
27. involved students in self-assessment of their performance.		
28. involved students in peer assessment of their performance.		
29. increased use of students teams in learning.		
30. increased use of assessable "products" of learning e.g., papers, projects, portfolios.		
31. specifically, increased use of writing and written assignments.		
32. specifically, increased use of oral-visual presentation		
33. specifically, increased use of exercises that require higher thinking skills level.		

Part III: Lessons Learned. Please describe what you would tell a faculty friend whose university was beginning a major project to improve the student learning process. What have you learned that is most important? What have you learned that should be avoided? (Continue comments on the back of this sheet if necessary.)

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STUDENT QUESTIONNAIRE

Exhibit 8b

Please rate the degree of your personal agreement or disagreement on each statement using the scale below.

---

5 Strongly Agree
4 Agree
3 Neither agree nor disagree
2 Disagree
1 Strongly disagree
0 Not applicable

Faculty in my major area have	Rating
1. developed of a set of outcomes that define what students in my major should know and be able to do by graduation (major outcomes).	
2. explained these major outcomes so that I understand what is expected of me by graduation	
3. involved other constituents (students, graduates, experts, employers, graduate schools) in developing these outcomes.	
4. systematically assigned responsibility for student learning outcomes, by level of development, to specific courses.	
5. developed criteria that define quality of performance for each outcome.	
6. developed specific outcomes for each course.	
7. helped change my view of how and in what ways students learn.	
8. used student learning applications/experiences in course(s).	
9. observed and assessed student performances and feedback.	
10. developed and used assessment forms based explicit performance criteria.	
11. involved students in self-assessment of their own performance.	
12. involved students in peer assessment of other student performances.	
13. used student teams in learning.	
14. used assessable "products" of learning e.g., papers, projects, presentations, portfolios.	
15. specifically, used writing and written assignments.	
16. specifically, used oral-visual presentation assignments	
17. specifically, used exercises that require higher thinking skill levels.	

18. I am a (circle one): Freshman Sophomore Junior Senior

19. My major is _____

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Central's Assessment Data System
Outline of CPI Measurement Goals and Plan

A. **Outline of Measurement Areas:**

The outline of CPI Measurement Goals and Plan attempts to address the latter of the two concerns expressed above. An informal group of faculty met to identify those general classes (categories) of measurement areas which are integral to the CPI model and its intended impact on student learning (see Data Outline & Flowchart). To evaluate the effectiveness of individual faculty members efforts and of the process as a whole, it was decided that there should be 5 classes of measures to capture all relevant data sources (date at which majority of area's instruments could be implemented in parentheses) :

- Customer Satisfaction or Perception Measures (In-place/1995)
- Learning Process Measures (1994)
- Measures of Student Performance (Currently in development/1994)
- Outcome Measures (1995-96)
- Other "Outside" and/or Demographic Measures (In-Place)

The outline addresses each of these areas and identifies specific examples and instruments which would/could be used to obtain relevant information.

D. Nimmer and M. Karscig have continued to meet this semester to examine what resources and mechanisms would need to be put into place to begin the development of the data bases which would aid in the implementation of the above instruments. Much thought discussion have been given to the data which are currently available and give insight into student performance, demographics, customer satisfaction and the learning process as a whole. Some of the short term, preliminary goals for the designing of an assessment data system here at Central would include (again, proposed completion dates in parentheses):

- Development of matrix which would identify **what** is to be measured, **when, where,** and **how** they were to be measured. (End of Spring 1994)

- **Where** the individual data elements will be housed - department, college, university levels. **Where** would the data be entered and **who** would have access to them. (Summer, 1994)

- **When** and **where** the data can be purged over time or with changes in courses/curricula and/or of a student's major. (Summer, 1994)

These issues must be addressed first before the actual work on the development of the assessment data system (ADS) and the planning for the hardware/programming resources necessary to sustain it are initiated.

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CPI Measurement Goals and Plan - DRAFT

MEASUREMENT AREAS

I. CUSTOMER SATISFACTION (PERCEPTION) MEASURES:

A. External Customers

1. Employer surveys
2. Graduate survey(s)
   a. Graduating Seniors
   b. Cohort groups.longitudinal data
3. Graduate/Professional Schools

B. Internal Customers

1. Student Satisfaction
   a. IDEA System (Course Evaluations)
   b. Student Defined Benefits (re. Brower article)
2. Faculty
   a. Organizational Culture/environment (instrument)
   b. Faculty supplier-customer relationships (QFD)
   c. Faculty satisfaction with CPI process
   d. Contact/relationships with external customers and associations (State of the art in the discipline)

II. LEARNING PROCESS MEASURES:

A. Outcomes

B. Curricular

C. Instructional

D. Student Learning Process

- Pre-admission - ACT
- Admission/Financial Aid
- Advisement
- Placement

1. Student evaluation & feedback on learning (e.g. 1 min. paper, focus groups, journals, etc)
2. Student involvement in process
   - Inside class (survey frequency & depth of involvement)
   - External (cross functional teams on curriculum, outcomes, assessment), etc
3. Co-curricular

III. STUDENT PERFORMANCE:

A. External (Comprehensive--across classes):

1. Where Assessed:
   •Entry to the University Studies (Placement, ACT) •Entry into Major Assessment
   •Mid-point Assessment of Intellectual skills (US) •Exit from Major Assessment
   •Exit University Studies
2. Types of Assessments:
   •Objective tests •Oral presentations
   •Written reports •Portfolios
   •In-Basket exercises

B. Internal (within courses)

•Objective Tests on Content Knowledge
•Essay Questions
•Writing Projects (Letters, Reports, Strategic Analyses, Employee Manuals, etc.)
• Oral Presentations (self evaluation, peer evaluation, instructor evaluation, and videotaping)
• Small-Group Projects (self evaluation, peer evaluation, instructor evaluation, and videotaping)
• Instructor rating of listening skills in lecture situation
• Instructor evaluation of role-playing situations

C. Evaluation of Assessment design and measures

IV. OUTCOME MEASURES (Program):

V. OTHER MEASURES

A. Student Demographics

B. CBHE "quality" variables

a. Number of African-American students graduating
b. Number of students taking standardized tests
c. Number of students taking local tests
d. Number of students in Critical Disciplines
e. ?

C. Support Services:

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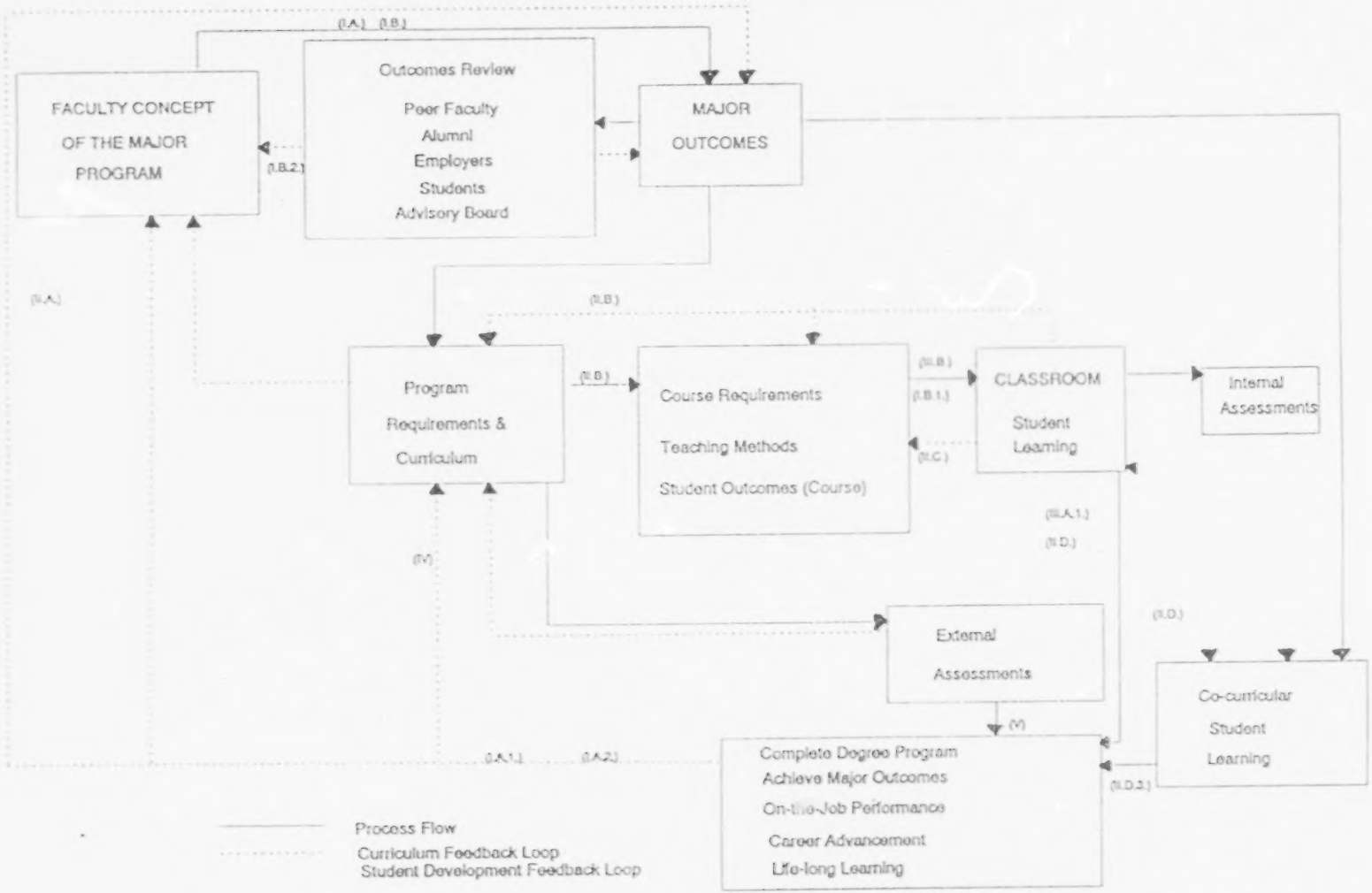
Curriculum Planning and Student Learning
CPI with Student and Program Feedback Loops



President Ed Elliott

From its very beginning as State Normal School Number Two, Central Missouri State University has put the people of Missouri first in its service, planning and development. Central is committed to the citizens of Missouri, and works closely in partnership with the people of this great state to carry out its mission. The education of students is at the forefront of all the institution's initiatives. Central is unquestionably, "The People's University."

Those of us in public education have an ethical and moral obligation to take the very broad base of society's human talents and abilities and identify how those can be enhanced through the educational process. At Central, we are dedicated to doing what we can to improve the lifestyles and career opportunities of all the state's citizens. We work to ensure the education of not only Missouri's children but also of the adults who want to continue their schooling and of the multitude of workers who lose or change their jobs each year and need retraining.

At Central, we have stopped segmenting education and have accepted it as a seamless, interwoven, lifelong process. The practice by some colleges and universities of controlling quality by restricting access is short-sighted. Limiting admission to only top-ranked students does not ensure the quality of an institution nor the value of an education. At Central, we don't spend our time devising ways to restrict access. Instead, we dedicate our efforts to improving the educational process and design, as we focus on quality graduates and performance standards achieved by our students.

Central offers many programs not found at other Missouri colleges and universities, and many of our programs are nationally or internationally known. We are one of the leaders in discipline-specific accreditations within Missouri higher education, and other colleges and universities have used some of our high-caliber programs as models at their institutions.

Through extensive collaborative efforts, we have developed and put into place an innovative and systematic teaching/learning/assessment model. We believe this approach, Continuous Process Improvement (CPI), will have an impact on the future of higher education in the state of Missouri and, possibly, all of education. As an extension of our CPI program, Central is leading a collaborative effort with elementary and secondary education to design, develop and test new

Quality education and high-caliber graduates are vital to Missouri's future, and Central Missouri State University works with students, parents, schools, businesses, government and the private sector to make Missouri public education the best it can be.

pre-kindergarten through baccalaureate degree learning process models. These partnerships between schools, students, parents, government, business and the private sector are contributing to quality education and to the successful reformation of Missouri's education system.

One of Central's key strengths lies at the heart of institutional integrity – a willingness to openly discuss and clarify the university's mission. We have established clear, measurable and achievable goals and objectives as a function of that mission and have created plans of action to accomplish agreed-upon educational outcomes. Maintaining high standards and achieving the designated mission are our highest priorities.

It is also important that we plan for academic and administrative changes to better achieve our mission and maintain standards. Task forces are currently at work on our campus to examine the university's organizational structure and admission policies, as well as resource reallocation and better ways to make campus-community connections throughout our service area. Through these task forces we are exploring new ways to better serve the people of Missouri.

Public education truly belongs to everyone, at all times. The people are the academy, and the process of learning is one that should fully empower every citizen. The strength of Missouri's education system will direct the state's future; and Central Missouri State University is dedicated to providing the people of our state with the highest quality educational system and experiences possible.

Please take some time to read this report. It is by no means all-inclusive, but it does provide some examples from the past year of the many ways Central Missouri State University is meeting its responsibilities as The People's University.

President

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(2)

CENTRAL's CPI RETREAT: 1994
"Delivering the Quality Promise"
EVALUATION

Continuous assessment/measurement is a necessary condidtion for continuous improvement. Please help us improve by providing us with your most thoughtful feedback on Central's CPI Retreat 1994.

PART I: Using the scale below, please rate the degree of your agreement or disagreement on each statement.

---

5 Strongly Agree
4 Agree
3 Neither agree nor disagree
2 Disagree
1 Strongly disagree

Part I

		Rating
1.	I have a clearer understanding of what Central's CPI is and is not.	
2.	I have a much clearer understanding of why CPI is so important to Central's future.	
3.	The 24 goals (1994-97) are clearly stated.	
4.	I believe the 24 goals are appropriate and focused on priorities.	
5.	I have a personal responsibility to "Deliver the Quality Promise."	
6.	Ed Elliott's vision for Central and where we are headed in the next few years is clear.	
7.	How we can collaborate to "Deliver the Quality Promise" is clearer than before the retreat.	
8.	I received the notebook in advance of the retreat.	
9.	The four priority objectives for the retreat were made explicit and clear.	
10.	I agree that we all have much to learn and that a major increase in faculty and staff participation in CPI/Quality/skill training is a top priority.	
11.	I will personally lead in deciding on planning and scheduling training.	
12.	The four general outcomes provide sound criteria for coordination of university and major studies.	
13.	The four outcome task teams can provide the basis for faculty learning and comprehensive assessment.	
14.	I will personally participate in one of the four teams.	
15.	I will persuade other faculty to participate in an outcomes task team.	
16.	We must spend much more time and money on CPI/Quality training.	
17.	If necessary to assure attendance, the academic calendar should be changed.	
18.	I now understand why we must work with K-12 schools and teachers on Quality improvement.	
19.	The breakout session I attended was very helpful.	
20.	The goals for the breakout session were made explicit and clear.	
21.	My overall rating for the CPI Retreat: 1994 is excellent.	
22.	You can count on me to be a Central CPI leader.	

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PART II: Comments.

23. Of the 24 CPI goals, I believe the following are most important:

24. The most important types of training needed are (please rank or rate, see Goal# 2):

25. Who should be responsible for planning training?

26. Who should be responsible for training scheduling and attendance?

27. How can we best obtain commitment from those in your department to attend the necessary training?

Breakout session attended: A (Gen Ed/Outcomes) __, B (Data) __, C (PK-16) __

28. What is the most important thing you learned in this breakout session?

29. What questions still remain or what material was ambiguous?

30. Which of the goals of the breakout session were most clearly achieved for you?

(3)

CENTRAL's CPI RETREAT: 1994
"Delivering the Quality Promise"
Saturday, July 16, 1994
REPORT TO THE PROVOST

Due: August 18, 1994

College: _____

Attendance: _____

1. **Action Plan** to implement Goal# 6: To have the principles and components of the CPI model operationalized in all departments and graduate programs with a minimum of 85% faculty involvement and participation by September 1997. Refer to Tab 5, College, "DRAFT DRAFT DRAFT," the ten major components of the CPI model.

Department	Component	Goals (each department)	Responsibility	Timeline

2. **General Outcomes Team:**
Goal# 8: To operationalize assessment/training teams representing faculty members from all colleges organized on the basis of the general outcomes--communication, human interaction, critical thinking, and valuing.

Department	Communication	Interaction	Thinking	Valuing

3. Training

Goal# 2: To design, develop, and implement a comprehensive training program for faculty (450), staff (200), and administrators (20).

Department	Type of Training	Number and names of Faculty	Responsibility	Dates

Types of Training:

1. Basic CPI Model, TQM Principles and Tools, Assessment-as-Learning, etc.
2. Applied Learning: Design and development of student learning experiences, criteria, assessment means, and feedback methods for a course or learning module
3. Quality leadership: Process improvement defined, analyzed, and designed by a cross-functional team.
4. Special Skill Training: Team learning, time management, management of teams and meetings, measurement, and classroom use of quality tools.
5. Training of facilitators:
6. Interorganizational Faculty training with PK-12 Teachers and administrators.
7. Other: _____

_____

POTENTIAL TRAINING DATES:

1. Thursday/Friday Prior to Plan Days	August 11/2 days
2. Friday (Mid-Fall) - District Teachers Mtg.	October 1 day
3. End of semester (Fall) after finals	December 11/2 days
4. End of Spring semester	May 11/2 days
5. Friday in June	June 1 day
6. Summer Planning Retreat	July 11/2 days
TOTAL DAYS	8 days

COORDINATING GROUP: Provost, CPI-Director, Assessment Director
Deans, Chairs, Cabinet, Directors

Exhibit 12

Dissemination Example
Ralph Mullin
Project Director

1. **Books Chapters**

Mullin, R., Shaffer, P., and Grelle, M., "A Study of the Assessment Center Method of Teaching Basic Management Skills," Chapter 9, Management Skills, John Bigelow, ed., 1991.

Mullin, Ralph F., Wilson George, and Grelle, Michael, "CQI: A Model for Reform Based on Assessment as Learning and TQM." Continuous Quality Improvement: Making the Transition to Education. Dean Hubbard (ed.), Prescott Publishing, Maryville, MO 1993

Mullin, Ralph F., Wilson George, and Grelle, Michael, "Decade of Transformation at Central Missouri State University," Continuous Quality Improvement: Making the Transition to Education, 2nd Edition, Dean Hubbard (ed.), Prescott Publishing, Maryville, MO 1993

Mullin, Ralph F., 1994, "Central Missouri State University: TQM Pilot Experience." Excellence in Missouri Foundation: Quality in Education. John Politi, Editor, Jefferson City, MO, December 1994.

2. **Other Publications.**

Mullin, Ralph F., "Changing the Teaching-Learning Paradigm: Central Missouri State University." Freshman Year Experience Newsletter, Vol.4, No.4, Spring 1992.

Mullin, Ralph F., "Quality in Higher Education," Kansas City Business Journal, September, 1994.

3. **Articles.**

Mullin, Ralph F. (1995) "Quality in Education: Central Missouri State's Decade of Transformation." Missouri Quality Award: Pilot Studies in Quality Education, John Politi, Editor. Jefferson City, MO: Excellence in Missouri Foundation, March

Mullin, Ralph F. and Wilson George, "Quality in Education: A New Paradigm and Exemplar." Continuous Quality Improvement: Making the Transition to Education, 2nd Edition. Dean Hubbard (ed.) Prescott Publishing, Maryville, MO 1995.

Mullin, Ralph F., Wilson George, and Grelle, Michael J. (1993)
"TQM: Revolution or Just Another Fad?" Commissioned Paper for the American Association for Higher Education "Double Feature Conference" on Assessment and Continuous Quality Improvement, Chicago, IL: June 9-12

Mullin, Ralph F., Wilson George, and Grelle, Michael J. (1993).
"CQI: A Model for Reform Based on Assessment as Learning and TQM." Continuous Quality Improvement: Making the Transition to Education. Dean Hubbard (ed.) Maryville, MO: Prescott Publishing.

Mullin, Ralph F. and Grelle, Michael J. (1992). "Changing the Teaching-Learning Paradigm: Central Missouri State University." Freshman Year Experience Newsletter, Spring Vol.4,No.4 (30,000 Circulation)

Mullin, Ralph F. and Grelle, Michael J. (1993) FIPSE Project Directors' Annual Program Book, Washington, DC: U.S. Department of Education, October.

Mullin, Ralph F. and Grelle, Michael J. (1992). "Basic Reform of Teaching and Curriculum: An Outcomes Driven Contiuous Improvement (CPI) Model." Proceedings Freshman Year Experience, Maintaining the Momentum, Teaching Meeting, Kansas City, MO, April 2-4.

Mullin, Ralph F. and Grelle, Michael J. (1992). FIPSE Project Directors' Annual Program Book, Washington, DC: U.S. Department of Education, October.

Mullin, Ralph F., Shaffer, Paul L. and Grelle, Michael J. (1991).
"A Study of the Assessment Center Method of Teaching Basic Management Skills." Chapter 9, Managerial Skills: Explorations in Practical Knowledge (ed.) John D. Bigelow. Newbury Park: Sage Publications.

Mullin, Ralph F. and Grelle, Michael J. (1991) FIPSE Project Directors' Annual Program Book, Washington, DC: U.S. Department of Education, November.

B. Papers/Presentations

August 1-4, 1995. "Transforming Faculty Work, Our Learning System and the University for the 21st Century: Physician Heal Thyself." Academy of Management Conference. Vancouver, B. C., Canada

May 1-4, 1995. Transforming Education: The Assessment Center Method as a Means." International Congress on the Assessment Center Method. Kansas City, MO

March 31-April 1, 1995. Midwest Academy of Management. St. Louis, MO

February 6-8, 1995. Malcolm Baldrige National Quality Award. "The Quest for Excellence VII." Washington, D.C.

February 1995. Invited consultant for review on assessment. Samford University, Birmingham, Alabama.

January 12, 1994. One-Day Seminar for Daniel Seymour, TQM in higher education author and consultant, Palm Springs, CA

February 11, 1994. "A New Approach to Learning: The Continuous Process Improvement Model for Undergraduate Education." Invited workshop (20) by College of Agriculture, University of Missouri, Columbia, MO

February 18, 1994. "A Model of Seamless PK-16 Education," Interdistrict Educational Alliance (15 Superintendants), Learning Exchange, Kansas City, MO. In conjunction with a planning meeting with Connie Campbell, Learning Exchange staff and CMSU College of Education leaders.

February 23, 1994. Central District, Missouri Association of School Adminstrators, "A Model for Reform to Develop a Seamless PK-12 System." School District Superintendants (43), Central Missouri State University, Warrensburg, MO

March 1-2, 1994. "Forget the Silly Notion That TQM Will Transform Education." First Annual Quality Conference, Ozarks Quality Council, AQP, Springfield, MO

March 4, 1994. Requested workshop on CPI for visiting faculty of East Central Oklahoma State University (Bill Osborne and Ed Russell) at Central Missouri State University.

March 11, 1994. Luncheon with potential funding partners for Phase V (1994-97). John Laney (Hall Family Foundations); Tom Sprott, Trading Area General Manager, IBM; Bill Berkeley, Tension Envelope, COB, Learning Exchange, Kansas City, MO

May 5-7, 1994. Invited Panelist "Outcomes Assessment." Western Regional American Accounting Association, Portland, Oregon tie to AACSB Airfare paid $300 Curt Deberg (FIPSE), FAX 916/898-4584, T- 6463 1) Decade 2) AAHE 3) Bio Mary Alice Seville T: 503/737-6060; FAX 503/737-4890

June 2, 1994. Luncheon with Ed Elliott, Connie Campbell and potential funding partners for Phase V (1994-97). Marilyn Kourilsky and Gary Baker, Kauffman Foundation; Regional for U. S. Department of Education; Kansas City Community Foundation and Affiliated Trusts; UMKC at the Learning Exchange, Kansas City, MO

June 11, 1994. "A Model of Seamless PK-16 Education," One-day Conference at Central with representatives of

June 23-25, 1994. "Learning Managerial Skills Across The Curriculum: What's the Next Step?" with John D. Bigelow, Stephen Robbins, and David A. Whetten. International Organizational Behavior Teaching Conference, Windsor, Ontario, Canada.

September 27-29, 1994. "Creating a Quality Learning System: Faculty Development." Two presentations with Dean Shaffer, Craig Christie and Lyman Porter at the AACSB Continuous Improvement Symposium, St. Louis, MO: American Assembly of Collegiate Schools of Business.

October 21-24, 1994. "Assessment of Educational Outcomes." Series of meetings with College Teaching Committee, chairs and faculty of the College of Commerce, DePaul University, Chicago, IL. Invited consultant.

October 28, 1994. "Quality, Assessment and Learning: Using Profound Knowledge for Quantum Improvement of the Student Learning Proccess." Metropolitan Community Colleges, In-Service Professional Development, Kansas City, MO

November 3-5, 1994. "Transforming Education: Start With Faculty, Bust The Paradigm, and Focus on Student Learning." Transforming Eduacation with Quality: Blueprints for Success. Fifth Annual Quality in Education Symposium. Salt Lake City, Utah. Two presentations

November 17-20, 1994. "The Seamless PK-16 System: Superceding the Carnegie Unit and Course-Credit Models." AAHE Fifth National Conference on School/College Collaboration. Washington D.C.

December 7, 1994. "Applying Quality and Assessment-as-Learning Principles to Improve Student Learning." Workshop sponsored by the Kansas City Professional Development Council, Longview Community College.

December 14, 1993. Seminar on CPI for visiting faculty (5), The University of Missouri, Columbia, MO

November 15-18, 1993. Three-Day Seminar for Sue Hodges Moore, University of Louisville, Louisville, TN. TQM in strategic planning and learning improvement in higher education.

October 27-28, 1993. Missouri Quality Conference, Jefferson City, MO "Transforming Education K-16: Quit Tinkering and Change the System."

October 18, 1993. One-Day Seminar for Peter Bishop, University of Houston, Clearlake, TX (IBM Award Grant Institution)

October 21, 1993. Invited Seminar on CPI for Deans Jefferson and Lawrence, Acceditation Team, American Assembly of Collegiant Schools of Business (AACSB), D208, Central Missouri State University.

October 8-10, 1993. FIPSE Project Directors' Meeting, Washington, D.C., "Practical Steps Toward Continuous Process Improvement (CPI): An Interactive Workshop" with Joan Straumanis and Mike Grelle

August 11, 1993. Board of Regents, Central Missouri State University, CPI Report and plans.

July 27-30, 1993. "TQM: Transforming the Core Learning Process, K-16." Fourth Annual Total Quality Symposium, Continuous Quality Improvement. Kansas City, MO. Presentation repeated Wednesday and Thursday

July 22-23, 1993. First Annual University Academic Planning Retreat on CPI. Planning, preparation, and coordination of this meeting to involve deans, chairs, assessment coordinators, and selected staff and administrators (70).

July 18-21, 1993. Society for College and University Planning, Boston, MA. "Planning for Contiuous Improvement: Start with the Faculty, Bust the Paradigm, and Focus on Student Learning."

July 14-15, 1993. Retreat for conceptualizing re-engineering with President Elliott and Quality Advisory Team, Ritz Carlton Hotel, Kansas City, MO

June 9-12, 1993. American Association for Higher Education "Double Feature Conference" on Assessment and Continuous Quality Improvement, Chicago, IL. (1) Criticism and Discussion of Commissioned Paper

June 9-12, 1993. American Association for Higher Education "Double Feature Conference" on Assessment and Continuous Quality Improvement, Chicago, IL. "Faculty Leadership of TQM: A Practical Model for Change," In-Conference Workshop.

May 19, 1993. Board of Regents, Central Missouri State University, CPI Report and plans.

May 14, 1993. Workshop for faculty of North Central Community College, Trenton, MO at Central Missouri State University on CPI and reform of student learning process.

April 28-30, 1993. "Improving Teaching Effectiveness: A Total Quality Systems Approach Starting with Faculty, Busting The Paradigm, and Focusing on Student Learning," with Rodney Sherman. Fourth Annual Business Teaching Conference, Minneapolis, MN

April 26, 1993. Invited Workshops (2) with Northwwest Missouri State University Faculty, Chairs and Administrators; plus Luncheon with President Dean Hubbard and Cabinet on CPI. Maryville, MO

March 17, 1993. Invited Seminar on CPI for Dean Jerry Johnson University of South Dakota, Acceditation Team, American Assembly of Collegiant Schools of Business (AACSB), D208, Central Missouri State University.

March 12, 1993. Kansas City Regional Consortium on Higher Education (KIRCHE) Workshop, Avila College, Kansas City, MO. Two presentations on Central's assessment experience.

March 5, 1993. Invited Seminar on CPI for Dean Quiester Craig, President, American Assembly of Collegiant Schools of Business (AACSB), D208, Central Missouri State University.

February 19, 1993. Missouri Board of Education and Department of Elementary and Secondary Education (DESE), Tan-Tar-A Lodge, Osage City, MO

February 16, 1993. President's Cabinet, Central Missouri State University. CPI Update Presentation and discussion

February 5, 1993. Commissioner of Education (DESE), Robert Bartman, Jefferson City, MO. Presentation on Central's CPI project with Joe Huber, Dean, College of Education & Human Services and Ted Garten, Chair, Curriculum and Instruction Department. This resulted in agreement to work together on reform and our presentation to the Board 2/19/93

January 26, 1993. Open Forum on CPI with students (@100) with George Wilson and Mike Grelle, University Union Ballroom

January 20, 1993. Open Forum on CPI with students (@100) with George Wilson and Mike Grelle, University Union Ballroom

January 13, 1992. "Update on CPI/FIPSE Project" President's Cabinet, Central Missouri State University.

April 2-4, 1992. "Basic Reform of Teaching and Curriculum: An Outcomes Driven Contiuous Improvement (CPI) Model." Maintaining the Momentum, Teaching Meeting, Kansas City, MO

June 20-23, 1992. "TQM for Faculty: A Practical Model for Improving Student Learning." 7th Annual American Association for Higher Education Assessment Conference, Miami Beach, FL

August 10, 1992. "CPI/FIPSE Update and Discussion" President's Cabinet and Academic Deans, Central Missouri State University.

August 12, 1992. "CPI/FIPSE Update and Discussion" Board of Regents, Central Missouri State University.

October 16-17, 1992. "Total Quality Management and Systemic Reform of Higher Education: An Outcomes Driven Continuous Process Improvement (CPI) Model." This workshop was repeated on the second day to assure complete coverage. FIPSE Project Directors' Meeting, U.S. Department of Education, Washington, D.C.

December 7-8, 1991. Two-day workshop on assessment design. James Roth, Professor, History, Alverno College (consultant) Central Missouri State University, CPI/FIPSE Project. Planning and coordinating.

November 1-4, 1991, FIPSE Project Directors' Meeting, U.S. Department of Education, Washington, D.C.

June 27, 1991, (1) Connections: Learning Principles of Human Interaction and Management from Art, Literature and Movies (with Larry Michaelsen); and (2) How Can Basic Management Skills be best Learned (with John Bigelow and Mel McKnight). International Organizational Behavior Teaching Conference, Bellingham, WA.

May 8, 1991, Teaching Basic Management Skills. 19th International Conference on the Assessment Center Method, Toronto, Canada

April 2-4, 1991, "Basic Reform of Teaching and Curriculum: An Outcomes Driven Continuous Process Improvement (CPI) Model." The Freshman Experience, Kansas City, MO

April 21, 1990, Assessment and the Assessment Center Method as Means of Improving Student Learning in Business Schools: Alverno College's Performance-Based, Outcome-Oriented Curriculum. Thirty-third Annual Meeting of the Midwest Division of the Academy of Management, Milwaukee, Wisconsin.

June 27, 1991, (1) Connections: Learning Principles of Human Interaction and Management from Art, Literature and Movies (with Larry Michaelsen); and (2) How Can Basic Management Skills be best Learned (with John Bigelow and Mel McKnight). International Organizational Behavior Teaching Conference, Bellingham, WA.

May 8, 1991, Teaching Basic Management Skills. 19th International Conference on the Assessment Center Method, Toronto, Canada

April 21, 1990, Assessment and the Assessment Center Method as Means of Improving Student Learning in Business Schools: Alverno College's Performance-Based, Outcome-Oriented Curriculum. Thirty-third Annual Meeting of the Midwest Division of the Academy of Management, Milwaukee, Wisconsin.

EXHIBIT 13

What Authorities Have to Say About Central's CPI Quality Reform*

"I am enormously impressed with what CMSU has already put into place so far in developing measures and assessing student learning and performance outcomes in their first four phases, and, frankly, I am in awe at what they propose to do in the next phase (Phase V). If they can actually deliver on what they promise – and I am convinced that they can – then it will be a signal accomplishment with exceedingly important implications for higher education. . . If we are ever to have a substantial test of both the feasibility and the degree of success of a competency-based assessment approach to higher education, this should be it."

Lyman W. Porter, Professor, University of California, Irvine
Past Board of Directors and Futures Project Chair, AACSB

"In my experience, I can name a handful of institutions that are "thinking and doing" what other institutions are talking about – that is, recreating themselves. Central Missouri State University is one of those institutions. . . They are not tinkering at the edges. They are looking to establish fundamental systemic change. They are documenting their work and writing a history of reform as they work to establish change. They are advocates. I have heard Ralph Mullin and others at Central speak at national conferences. They tell a powerful story. . . Central is operating in a very non-higher education manner. They began their transformation work without funding. No one dangled any money. The motivation was pure and because of that their ideas have far greater meaning and passion."

Daniel Seymour, President, Q Systems
Author and Consultant IBM, AAHE, ACHE

"Transforming and restructuring universities will not come easily. Without severe external pressures to reform, few universities will commit and endure. Quality transformation is not for the timid, the comfortable, the fastidious, or the selfish. It is the preserve of people of strong beliefs and actions. Not the talkers but the doers, like Hewlett Packard and Hallmark Cards. Central Missouri State University may be just such a needed benchmark and role model for reform in higher education. . . Central has made a fundamental commitment to restructure the whole university focused on a sound new core learning process. The CPI model can provide leaders with an effective prototype for reinventing universities, connecting them with PK-12, and increasing real productivity and quality as defined by the customer."

Arthur D. Wainwright, Chairman, Wainwright Industries, Inc. and
Winner of the 1993 Missouri Quality Award and
1994 Malcolm Baldridge National Quality Award

"In developing a 'continuous process improvement' model for monitoring and guiding the didactic process, the University [Central] has taken advantage of the techniques used so successfully in recent years by corporate America in achieving dramatic performance improvements. . . It is also my belief that what is going on at CMSU will prove in time to be a model of singular importance for other institutions of higher learning in our region, as well as across the nation."

John L. Aitken, Ph.D, Vice President, Quality Performance, Marion Merrell Dow
and Director, Excellence in Missouri Foundation

"As President of The Learning Exchange and a member of Missouri's Coordinating Board for Higher Education, I have opportunities to study and evaluate a broad range of innovation American education. In the past twenty years, I have never observed the depth of commitment and leadership toward a new vision and system of higher education than that at Central Missouri State University."

Connie Campbell, Ph.D., President, The Learning Exchange

"I was impressed with the foresight that you are applying to new ways of handling the education objectives and the inclusion of quality."

Robert W. Galvin, Chairman of the Executive Committee, Motorola Inc.

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"The serious need for the kind of reform in higher education that Central proposes to effect is apparent. The scarcity of response to that need on the part of post-secondary institutions is equally apparent. . . As someone who works with numerous institutions, I know of no other one of its size in this country that has managed a comparable breadth of effort and perseverance in establishing an educational process based on articulated outcomes expected of graduates. Central's development thus far gives strong indication that they are capable of and ready for systemic change as an institution."

Georgine Loacker, Ph.D, Alverno College

"You are doing some really exciting work at Central Missouri and your leadership in assessment and quality applications in learning is going to be important nationwide.

Monica M. Manning, Ph.D, Academic Quality Consortium

"Yours is the only campus in the country, to my knowledge, that has allowed the idea [TQM] to arise from, and simmer among, the faculty first. I predict that your approach will (a) pre-empt diversionary problems many other campuses have experienced and (b) greatly increase the likelihood of relatively rapid change in the short term."

Ellen Chaffee, President, Mayville State University
TQM consultant and author

"To adequately deal with the crises of quality, productivity, and rising costs in higher education, we need pilot sites of successful systemic transformation which succeed not for themselves alone, but also as learning and demonstration sites for all other institutions. Central Missouri State is already thinking about, and preparing to become, such a demonstration site."

Michael Brower, President, Michael Brower Associates

"Most educational leaders don't have a clue as to what is involved in a Total Quality Program and the commitment that is required. . . We will need a few universities with the leadership, commitment, and profound knowledge necessary to show that it can be done and how to do it. Central certainly is one of the few with capacity to do this."

Robert E. Harmon, Chairman, Harmon Industries

"I am profoundly struck by what I found in their [Central] unique educational structure. First, there is a dedication to consistency of purpose. Second, a basic understanding and appreciation for profound knowledge that they have embodied in their culture. Third, a strong sense of shared values for their mission and purpose for continuous process improvement. Last, the most fundamental of all, is their desire and awareness for the need to change."

Dr. Robert E. Bush, Vice President, Northwest Missouri State University

"During the past five years as an American Council on Education Fellow and as a NCA evaluator, I have visited over 60 campuses -- public and private, large and small. Central is the only one which could be a model for quality improvement throughout the institution. . . [One] cannot find another institution with the leadership, vision and commitment to the monumental 'paradigm shift'."

Linda L. Lamwers, Assistant Vice President for Academic Affairs
St. Cloud State University

"What I found [at Central] was one of the most exciting yet daunting experiments I could imagine for higher education. The excitement came from a group of academic professionals who were rethinking the purpose of education in modern terms. . . they were asking the fundamental question about how best to organize a process to maximize learning."

Peter C. Bishop, Chair, Studies of the Future,
University of Houston, Clearlake

*Note: Quotations excerpted from letters of support for Central's FIPSE Proposal for Phase V (1994-97)

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